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AN EVALUATION OF THE BIRD /AIRCRAFT STRIKE HAZARD AT SELECTED U--ETC(U)
JUN 79 J S KENT, J SCOTT, W H NIEMEIER

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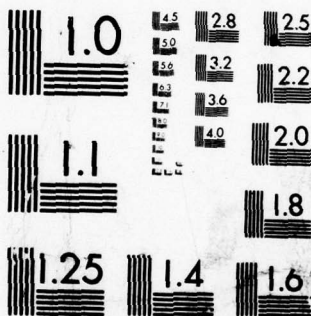
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AN EVALUATION OF THE BIRD/AIRCRAFT STRIKE HAZARD AT SELECTED UNITED KINGDOM BASES:

RAF MILDENHALL, RAF ALCONBURY, RAF UPPER HEYFORD, RAF BENTWATERS, RAF FAIRFORD, RAF LAKENHEATH, AND RAF WOODBRIDGE,

Final rept. Nov-Dec 78

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JUN 1979

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PREFACE

This study was performed under Program Element 91412 F, AFESC JON 00DEVN 11. Inclusive dates of the study were 3 November through 4 December 1978.

This report has been reviewed by the Information Office (OI) and is releasable to the National Technical Information Service (NTIS). At NTIS it will be available to the general public, including foreign nations.

This memorandum has been reviewed and is approved for publication.

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SECTION I

INTRODUCTION

The Bird/Aircraft Strike Hazard (BASH) Team visited the United Kingdom (U.K.) from 3 November through 4 December 1978. Our purpose was to evaluate bird strike reduction programs at RAF Mildenhall, RAF Lakenheath, RAF Bentwaters, RAF Alconbury, RAF Upper Heyford and RAF Fairford. Our recommendations will help individual bases implement the bird hazard reduction programs they have established. These recommendations provide a program to define responsibility and authority for bird hazard reduction, alternatives for composition of a Bird Control Unit, information to train and equip bird control personnel, habitat modifications to reduce the attractiveness of airfields to birds, a system to warn pilots about high bird strike risks in specific areas, and methods of reducing pest bird problems in storage buildings and hangars. Parts of the report apply to all 3rd Air Force bases, and some recommendations are site specific.

Until October 1978, airfield bird control at USAF bases in the United Kingdom was the responsibility of Longwings, Ltd., Norwich, U.K. (Appendix A). In the contract, Longwings provided bird control on six bases for three years at a cost of 213,000 pounds (approximately \$425,000). "Falconry and other means" were used to scare birds from airfields. Birds of prey cannot be flown in high winds, heavy clouds or rain. The birds themselves were strike hazards when used in the immediate vicinity of aircraft. Man-hours worked by the falconer, and reports about specific tasks and accomplishments were never documented and made available for Air Force review. The contract was not considered cost-effective by 3rd Air Force, therefore, it was not renewed for Fiscal Year 1979. Each base has been tasked to develop its own bird hazard reduction program.

No program will totally eliminate the possibility of a bird strike. Birds will continue to use airfields, and migrating flocks will always occupy airspace with our aircraft. However, most bird strikes (67 percent) occur below 1000 feet above ground level, often in areas where we can exercise control. A safer flying environment will result from a comprehensive program to reduce bird strike hazards. This program requires the allocation of funds and manpower. People who operate the program must be dedicated, responsible and knowledgeable. Good communication and coordination are essential. The underlying key is an active awareness and a genuine concern for the reduction of bird/aircraft strike hazards.

SECTION II

DESCRIPTION OF BIRD HAZARDS AND PROBLEMS

1. Large numbers of birds are found over most of the U.K. Several species frequent airfields and are the major contributors to bird/aircraft strike hazards. Flocking birds create the greatest danger, and gulls cause more damage than any other group of birds (Reference 1). Black-headed Gulls (Larus ridibundus), Common Gulls (L. canus), Herring Gulls (L. argentatus), Lesser Black-backed Gulls (L. fuscus) and Great Black-backed Gulls (L. marinus) cause the most trouble. Lapwings (Vanellus vanellus), Rooks (Corvus frugilegus), Carrion Crows (C. corone corone), Jackdaws (C. monedula), Starlings (Sturnis vulgaris), Feral Pigeons (Columba livia) and Woodpigeons (Columba palumbus) congregate in flocks and create hazards on airfields. Birds living in small groups such as Pheasants (Phasianus colchicus), Red-legged Partridge (Alectoris rufa) and Partridge (Perdix perdix) also live on airfields and create hazards. Hares (Lepus europaeu) and rabbits (Oryctolagun cuniculus) live on airfields in large numbers. These mammals can cause strike damage themselves and furnish food for raptors (birds of prey) which are attracted to airfields to hunt. Pigeons, Starlings, Wood-pigeons, and House Sparrows (Passer domesticus) live in many hangars and storage buildings. Their excrement produces an unsanitary, unaesthetic working environment. Droppings are caustic to aircraft and equipment and result in many wasted man-hours for cleanup. These bird and mammal problems occur in the airdrome where control may be exercised in their dispersal.

Low level flights expose aircraft to bird strikes in areas where no control of birds is possible. Large flocks of ducks, geese and swans migrate each winter to The Wash, the primary range used by our aircraft in the U.K. (Figure 1). This estuary in the southeast portion of the U.K. holds some of the largest populations of waterfowl in Europe. Other large shore birds such as herons and cranes may be involved in serious bird strikes. Operational safety precautions can be implemented to reduce the probabilities of these bird strikes.



SECTION III

RECOMMENDATIONS FOR BIRD HAZARD REDUCTION

1. Bird Hazard Working Group and Bird Control Unit

Effective compliance with AFR 127-15 requires an organized program for bird hazard reduction. A written bird hazard reduction plan is necessary to provide continuity to the program and document reasons for habitat modifications to airfields. New personnel can easily become familiar with local bird problems and procedures for dealing with them. A sample plan used successfully by another base is provided in this report (Appendix B). A Bird Hazard Working Group (BHWG) should be created with members from Flying Safety, Director of Operations, Flight Facilities, Base Operations and Civil Engineering. The BHWG should review all aspects of the bird hazard program. In addition to implementing recommendations in this report, the BHWG should review the local flying operations and determine what modifications could be made to reduce bird hazards and make pilots more aware of the hazards. The BHWG should:

- a. Define the local bird problem and possible changes in procedures to avoid the birds.
- b. Develop a plan to carry out avoidance procedures. The plan can be in the form of a supplement to AFR 127-15 or an OI.
- c. Define responsibilities for various aspects of bird control.
- d. Inform aircrews of procedural changes to be initiated.
- e. Prepare briefings, posters, etc., for educating aircrews on bird strike hazards.
- f. Review and modify procedures and recommendations to improve the base's BASH program.

The BHWG need not be a separate group that would increase workloads with meetings and reports. Ideally, the BHWG should be a subcommittee of an existing group such as the Air Traffic Control Board, Safety Council or some similar group. The BASH problem can be treated as an open agenda item, with the BHWG resolving problems concerning implementation of these recommendations in addition to developing and overseeing the BASH program for the base.

Active bird control is needed for immediate solutions to bird hazards in the airdrome. This was formerly the responsibility of falconers employed by Longwings, Ltd., and now must be assumed by base personnel. The British air bases maintain a three-man Bird Control Unit (BCU) whose only duties are to remove bird hazards from their airfields (Reference 2). Extended duty hours involved in providing dawn to dusk protection make it impossible for one man to effectively remove bird hazards from airfields. The BASH Team recommends a BCU consisting of at least three persons be established at each of our U.K. bases to be responsible for bird hazard reduction and pest bird control. Alternatives for team composition are considered in Appendix C. Bird hazard reduction should be the full-time responsibility of at least one member of the BCU, with additional slots allocated on a rotational and as needed basis. In addition, the Airfield Manager and NCOIC of Base Operations should be trained in bird control.

Responsibilities for airfield bird control and BCU team composition must be delegated by the BHWG. At most bases, bird control is under the authority of Airfield Management with Base Operations personnel providing most of the manpower. Personnel from Security Police and Fire Department may also be used as the situation dictates. Regardless of team composition, documentation of hours expended in bird control is presently the only means to justify permanent positions. Manpower slots for bird hazard reduction are available, but the need must be demonstrated by recording the time spent scaring birds from airfields and eliminating pest birds from hangars and storage buildings. The BHWG and the individual bases will assign tasks and duties for the BCU. An outline which may be used is provided as an example in this report (Appendix D).

2. Habitat Modification: The most effective means of reducing bird populations on airfields is to eliminate those characteristics which attract them. Birds frequent airfields to find food, safe rest or breeding areas. If these attractants are eliminated, bird populations will be reduced and hazards lessened. Changes in airfields do not bring about rapid results, and only a long range program will be effective. These techniques require expense, planning and coordination, but are the best overall bird reduction measures. These recommendations apply to all the bases surveyed. Several site specific problems are also addressed.

a. Grass Height Management: Controlling grass height is one of the most effective techniques for reducing airfield attractiveness to birds (Reference 3). Flocking birds, particularly gulls, Starlings, and Lapwings, use airfields as secure areas to loaf and feed. Short grass allows birds

to see each other to retain flock integrity and to see predators at a great distance. Short grass also makes feeding easier as invertebrates are exposed and readily available to the birds. Long grass obscures the birds' visibility making them less secure and making food more difficult for the birds to find. Statistically, long grass not only reduces the number of birds by at least half, but also reduces the frequency of occurrence (Reference 4). Gulls and Lapwings are the species most effectively repelled by long grass. Grass heights on airfields are now cut short, less than 5 cm (2 inches).

Grass in the U.K. is capable of producing a 23 cm (9 inch) stem which will stand erect. Airfields in the U.K. with existing long grass policies have used the grasses already growing on the airfields and no major changes in fertilizing or grass types have been necessary (Reference 1). The recommended height for grass in the U.K. is 15 to 23 cm (6 to 9 inches). Once each year the grass should be cut short (bottomed out) and the clippings removed. Mid-spring is the best time of year to cut the grass short because birds are nesting and flocking is minimal. The short cutting improves the quality of the turf and can be done with gang mowers presently in use.

Following the initial cutting and clipping removal each year, maintain the grass between 15 and 23 cm. Contracts for mowing airfields are awarded through the Property Services Agency under the Department of Environment. In many cases contractors already have the equipment for removing clippings and rotary mowers needed to maintain grass at the longer heights. Contractors at RAF Mildenhall and RAF Upper Heyford confirmed inquiries about equipment availability. Rotary mowers do not cut as wide a path as gang mowers, resulting in a higher expense per cutting. However, the number of cuttings each year will be fewer so overall costs should change very little. Any portion of the airfield not under security restrictions should implement a long grass policy. As a minimum, areas within 183 meters (600 feet) of runway centerlines should have long grass. Grass around runway and taxiway lights must be kept short to maintain good visibility.

b. Food Control: Easy access to food on airfields is another strong bird attractant. Earthworms (Lumbricoides sp.) are present in large numbers around most airfields. After heavy rains, earthworms often crawl onto paved surfaces and become an easy food source. A legal chemical to poison earthworms should be sprayed according to label instructions. Spraying should be out 31 meters (100 feet) from the edges of paved surfaces on the airfield. The chemical will reduce earthworm populations near paved surfaces and lessen the bird attractant. Long grass will also make invertebrates less

available to the birds. Any questions relating to legal pesticide use should be addressed to the Pest Infestation Control Laboratory, London Road, Slough, Berks SL3 7HJ. The USAFE Staff Entomologist must be consulted before all pesticide application.

c. Sanitary Landfills. Food is also readily available for birds in sanitary landfills. Gulls and corvids (crows, Rooks and Jackdaws) are especially attracted. Landfills create a well documented bird strike threat (Reference 5). RAF Lakenheath, RAF Upper Heyford, and RAF Fairford all have sanitary landfills near active runways. These areas should be watched carefully for bird activity which may affect the bases. While no control can be exercised over off-base landfills now in use, the Air Force has the opportunity for inputs when new landfills are created. New sanitary landfills should not be authorized near a base. Problems are most severe if the airfield is between the landfill and local bird roosts. Current FAA Regulation 5200.5 prohibits landfills within 3048 meters (10,000 feet) of active runways used by jet aircraft in the U.S., and the International Civil Aviation Organization recommends no landfills within 12.8 km (8 miles) of airfields. These guidelines should be considered when new sanitary landfill sites are discussed.

d. Standing Water: Standing water on airfields attracts gulls and waterfowl. Low areas where standing water has accumulated are difficult to mow, and uncontrolled plant growth can provide additional habitat for birds. Standing water was observed at RAF Woodbridge and RAF Bentwaters. After heavy rains, areas holding water should be marked, filled, leveled and planted with a local variety of commercial grass seed to stop erosion. Large construction projects at the bases should provide an adequate source of fill.

e. Plant Control. Diverse plant species on airfields provide varieties of habitats which attract birds. When the variety of plant species is reduced, bird control problems are simplified. For example, when trees on the airfield are cut down, perching birds have no resting place and one of their reasons for remaining in the airdrome is eliminated. If cover is removed, pheasants are less likely to live on the airfield. When removing any trees, proper clearance through British channels is required.

f. Site Specific Recommendations: During the assessment, specific areas of concern at several bases were addressed. Recommendations for individual bases are listed as follows:

(1) RAF Mildenhall

"Mon's Woods" located at the east end of the refueling tank parking area is a Rook rookery. Dutch elm

disease has killed most of the trees. The dead trees should be cut down and the underbrush removed.

(2) RAF Lakenheath

(a) Sewage is spread on a limited basis over the grass on the airfield to fertilize the ground, attracting birds for several days. The hazard will be reduced if sewage is dumped on Friday afternoons. Flying is minimal on weekends and by Monday mornings, most of the bird attractant is gone.

(b) A sanitary landfill is located about 500 meters from the active runway. Birds were not observed using the landfill when the assessment was conducted, but they may frequent the area at any time. If birds begin using the landfill, active scaring at the edge of the airfield should discourage them from flying over the airdrome.

(3) RAF Bentwaters

(a) Low areas opposite Taxiway 1 on the south side of the runway, approximately 200 meters from the centerline should be filled to eliminate standing water.

(b) Brush around a Security Police telephone on the south side of the runway between Taxiways 1 and 2 should be removed.

(c) The large brushy area on the south side of the runway, near the fence and opposite Taxiway 2 should be cleared.

(d) Trees in the Weapons Storage Area hinder visibility and attract birds and rodents. These trees should be removed.

(e) The trees near the Bypass near the Victor Alert area hinder visibility from the Tower, are a security risk, and attract birds and rodents. The trees should be removed.

(f) Woods south of Taxiway TAPA attract birds and should be cut down.

(4) RAF Woodbridge

(a) Brush around the storm drain holding pond on the east end of the runway should be removed.

(b) Small brushy areas in the clear zone at the east end of the runway should be cleared.

(c) The runoff collection area at the north side of the airfield near the east end of the active runway should be filled to eliminate standing water.

(d) A low, brushy area on the north side of the airfield directly opposite the 78 TFS should be cleared.

(e) Woods opposite the 67ARRS which contain the Small Arms Firing Range and Boy Scout camping area are in the clear zone and create bird attractants. These woods should be removed or at least thinned.

(f) The vegetation in the clear zone on the west end of the runway has become dense. This provides excellent habitat for pheasants and partridge and should be cleared.

(g) An old munitions disposal site near the football field on the south side of the runway should be cleared and mowed.

(h) Trees near the football field on the south side of the runway and trees half way between the Control Tower and Fire Department attract birds and should be removed.

(i) Water in the fire fighting storage tank in the old Victor Area attracts gulls. The attractant would be reduced if the water level were lowered one meter.

(5) RAF Upper Heyford

(a) A sanitary landfill is located on the approach to Runway 09. Every bird strike in the local area during 1977 was over the landfill. One person is employed by the landfill operators to scare birds. Coordination with employees at the landfill may help minimize the hazard during periods of heavy flying by altering dumping schedules and helping with bird control.

(b) Starlings roost near Base Operations and Civil Engineering buildings. Their droppings create an unaesthetic and unsanitary condition, but the flocks do not presently interfere with flying operations. The activity of the roost should be closely monitored to be sure safety hazards do not develop from the birds. The roost can be moved by using bioacoustics and pyrotechnics. The roost should not be moved to an area that will increase the flying safety hazard. Continual harassment can move the roost anywhere on base.

(6) RAF Fairford

(a) A pond on base is the home of a pair of swans and several waterfowl. The birds make passing flights over the runway several times daily. If these birds become a hazard, the pond should be drained to keep birds away.

(b) Lapwings are abundant in the local area. British bird control personnel used up to 1000 shellcrackers per month to scare the birds (Reference 6). An intensive active control program is needed to discourage the birds from using the airfield.

(c) A small Rook roost and nesting area is found in some trees on base. High pressure water hoses may be used to chase birds from the trees.

(d) A sanitary landfill is located near the base and is an attractant for crows and Rooks. Flight patterns should avoid the landfill whenever possible.

(7) RAF Alconbury

A very large starling roost is found in dense woods about 16 kilometers (10 miles) southwest of the base. Early morning or late afternoon flights over this area should be avoided, because birds are departing and arriving at the roost during these periods.

3. Active Bird Control

Despite changes to the airfield, birds will continue to use airdrome environments. Active bird control is needed for short-term solutions to bird hazards. Birds move quickly and unpredictably and even when left in a "safe" portion of the airfield can become a hazard at any time. The birds may also act as decoys, attracting others. For these reasons, all bird flocks should be dispersed immediately after they come to the airfield. Birds are persistent and require constant harassment to discourage their use of airfields. Ideally, the Bird Control Unit will be on the airfield from dawn to dusk each day providing bird dispersal. Coordination with the Control Tower is required before any birds are dispersed from the airfield. This will prevent scaring birds into the path of airborne aircraft. A variety of equipment has been authorized in TA483, TA001, TA002 and TA479 for bird control (Appendix E). Scaring birds will involve a vehicle, radio communication with the Control Tower, bioacoustics equipment, and pyrotechnics.

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a. Vehicle. A vehicle must be made available for the Bird Dispersal Team. Since driving off paved surfaces may be required, four-wheel drive is essential. Open tread tires will help keep sod from adhering to the vehicle and reduce foreign object damage on runways. When M-74 airbursts are used, a sign saying "Class B Explosives" must be placed on each side of the vehicle during transport from munitions storage to the airfield. These may be attached by welding metal brackets to the sides of the vehicle so signs can be removed when pyrotechnics are not being carried. Two fire extinguishers in the vehicle are required by AFR 127-100 when using pyrotechnics.

b. Bioacoustics. Bioacoustics is a bird control technique using recordings of distress calls emitted by birds under stress. A speaker is mounted on a vehicle containing sound equipment capable of producing 30 to 50 watts of distortion-free sound in 90 to 110 dB with a frequency response of 14,000 HZ. Tapes are available free of charge by mailing empty single loop TDK EC-1 cassettes and a list of species needed to the Ministry of Agriculture Fisheries and Food, Hook Rise South, Tolworth, Surbiton, Surrey KT6 7NF. In operation, the vehicle is driven 100 to 150 meters upwind of the birds and stopped with the speaker pointed toward the birds. The operator identifies the birds and selects the proper tape. Proper identification is important because distress calls are species specific. What is effective on Herring Gulls may not work for Common Gulls. The distress calls are played for 15 to 20 seconds and shut off. If the birds have not moved within 20 seconds, a second playing of the same duration should be used. If the birds have not moved by the third attempt, it is unlikely that they can be moved with this method. Do not allow the tape to continue playing indefinitely. Birds may become habituated and the calls will be ineffective. When birds react to distress tapes they frequently fly toward the vehicle to investigate the "hurt" bird. They may circle overhead for a short time before leaving. At this time pyrotechnics may be used to hasten the birds' dispersal and control their direction of flight. Using pyrotechnics earlier may confuse birds and cause them to remain near the airfields longer. Distress tapes require some time to remove birds, and this method is the most useful during breaks in flying and before flying operations begin each day.

c. Pyrotechnics. Pyrotechnics are noise producing devices which are extremely effective for scaring birds. They include airbursts, shellcrackers, and gas cannons. The only pyrotechnics presently approved for permanent use by the Air Force are gas cannons and airbursts. The M-74 airburst is fired from the M-1 flare pistol and Marshall-

Hyde scare cartridges are fired from a single shot break-open 12 gauge shotgun. The pyrotechnics fire an explosive projectile about 100 meters before a secondary explosion occurs. To be most effective, airbursts should be exploded above flocks on the ground on the side opposite the desired direction of the birds. Ear protectors, gloves and goggles are required when using any pyrotechnic device. Pyrotechnics must never be fired towards aircraft, and Security Police and Control Tower personnel must be contacted before their use. Training in the use of pyrotechnics is necessary for each person involved in scaring birds. Such training is provided by the NCOIC for Small Arms. A sample of the Safety Operating Instruction for handling pyrotechnics is provided in this report (Appendix E). This sample should be modified for use by individual bases.

4. Operational Activities Which Reduce Bird Hazards.

When environmental modification and active controls do not satisfactorily reduce bird hazards on the airfield, options must be considered for modifying flying operations to reduce the risk of bird strikes. These operational changes will be dictated by the severity of the problem, the performance capability of the aircraft, and training or readiness requirements. Bird/aircraft strike hazards are like any other safety hazard which must be assessed with respect to operational requirements. Clearly, during contingency operations or advanced stages of readiness, bird hazards have little safety priority. However, during training to maintain an operational readiness, certain changes can be made to improve safety and reduce costly repairs.

The BASH Team cannot provide all the possible operational changes which could be made in an operational unit to reduce bird hazards. A knowledge of unit operational and training requirements, combined with an understanding of local flying restrictions, is required to evaluate possible modifications to local procedures.

The BHWG forms the foundation for developing a bird control program. The following recommendations will aid in reducing bird hazards through modification of operational procedures. Many of the recommendations will apply to the bird hazard reduction at any base.

a. Runway Supervisory Unit (RSU) personnel can play a major role in operational bird avoidance and bird control. Because the RSU is located near the touchdown zone, the RSU controller has a better view of the bird hazards than Tower personnel and can warn the aircrews of the hazard. RSUs are equipped with radios and telephones, providing all the necessary tools to warn pilots, initiate a BIRD WATCH, and direct a bird patrol to an area where the birds are concentrated.

Working with Tower, Approach Control and the SOF, the RSU can make immediate changes in operational procedures to improve safety. RSUs can change formation takeoffs and landings, coordinate restricted altitudes for low approaches, request pilots to enter holding patterns, require pilots to make full stop landings and coordinate aircraft recoveries at intervals when bird activity is diminished. The USAFE concept of an RSU controller allows for considerable time to be devoted to monitoring bird hazards. As a safety observer, the RSU controller's duties in bird hazard reduction complement other functions of evaluating landings and performing safety checks of aircraft. The RSU controller should be given authority to cancel landing or takeoff clearances as necessary to avoid an apparent conflict between birds and aircraft. He should also be given the authority as a safety observer to declare or change BIRD WATCH conditions (described later in this report), as the situation dictates.

b. Mission Aborts Due to Bird Strikes. Abort a takeoff or planned touch-and-go if a bird strike occurs and sufficient runway remains to stop. Bird strikes can cause undetectable damage which may result in a complex airborne emergency. Damage assessments can only be made by maintenance personnel. Several bird strikes which appeared to cause minor damage have proven to be much more substantial and, had the pilots continued the mission, a serious emergency would have resulted. Structural damage, such as a dent in the wing, has led to fuel and hydraulic system failures.

c. Takeoff Procedures. Aircraft making formation departures increase their risk of damaging bird strikes when birds are feeding or loafing on and near the runway. This situation can be avoided by making single-ship departures and by using active control to scare off the birds before formation departures. Wing and interval takeoffs with the wingman taking 6 to 10 second spacing often result in birds being scared up by the lead aircraft. The wingman then hits the birds. Birds may be scared up by departing aircraft, requiring pilots of lead aircraft to be alert and warn wingmen of bird hazards during takeoff roll. Wingmen may abort the formation takeoff if flocks of birds hit the wingman's aircraft. This is especially important for wing takeoffs where all of the wingman's concentration is on what his leader is doing and he is unaware of the size of the bird hit or its impact location. Flight lead should also provide warning to other members of the flight when aircraft take spacing on the runway by delaying brake release. If large flocks of birds are scared up by the lead aircraft, his wingmen may want to delay their departure until the birds are clear of the runway.

d. Where flocks of migratory birds are a problem, aircraft formation departures involving rejoins after takeoff increase the risk of serious bird strikes. Turning and straight-ahead rejoins require greater attention by pilots to the lead aircraft's position. Pilots cannot adequately clear for birds while simultaneously attempting to join on lead's wing. The increased speed necessary to overtake the lead aircraft after takeoff further increases the risk of damaging bird strikes. When birds are known to be flying in the area, departures under visual meteorological conditions may require modification to reduce the risks. Departures should be made in trail, with the rejoin beginning after the aircraft pass 2000 to 3000 feet AGL. If aircraft are to immediately enter a low level route or stay at an intermediate altitude for a prolonged period of time, a tactical formation would be advised, providing sufficient aircraft clearance to allow wingmen to clear for birds. Where weather is a factor, wing takeoffs are preferred, realizing that many bird strikes occur just before entering a low overcast or immediately above an undercast sky condition.

e. Enroute bird strikes should abort the mission, and the aircraft should land as soon as possible. While an engine ingestion or a canopy strike may be readily apparent from the cockpit, many fuselage, wing, tail or radome strikes cannot be adequately assessed for damage. Continuing a mission may result in greater structural damage and an emergency situation later in the flight.

f. Checklist Procedures and Pre-briefings. Low-level bird strikes with fighter aircraft have resulted in the loss of 8 lives and 11 aircraft. Higher aircraft speed and greater exposure within the bird's flight environment have also led to many damaging and injurious bird strikes. Many of these strikes occur at low level and bombing range entry points. Pilots and weapons systems operators are then involved in cockpit duties which cause crewmembers to reduce their eye contact outside of the cockpit. Greater emphasis needs to be placed on "heads-up" flying during these critical transitions. Checklist items should be accomplished in such a manner as to allow for maximum eye contact outside of the cockpit.

In reviewing F-111 accidents where bird strikes have destroyed the aircraft and the crew has survived, certain factors are clear: wind blast, rapid deterioration of engine performance, failure of cockpit communications, or personal injury have all resulted in disorientation and chaos. Briefings of bird strike emergency procedures before each flight may save an airplane and its crew. An inflight bird strike is much like a takeoff emergency where urgency

dictates a pre-planned course of action. As a minimum, pilots should brief (or be briefed on) the following:

- (1) Wear of the double helmet visor during daylight hours, the clear visor at night.
- (2) Lost cockpit communications.
- (3) Positive change in aircraft control.
- (4) If flocks of birds are encountered, initiate a climb since most flocks are distributed in a downward direction in the air space.
- (5) Evasive maneuvers at low altitude.
- (6) The need and procedures for a controllability check in the event of a damaged airframe.
- (7) Engine failure procedures if birds are ingested.
- (8) Aircraft recovery procedures and routes of flight to return to base with a minimum of cockpit communication.
- (9) Locking of shoulder harnesses of injured crewmembers to prevent falling forward onto flight controls.
- (10) Ejection procedures in the event that control cannot be maintained.

The aircrew's ability to react to a bird strike situation is further enhanced by briefing bird strike procedures during continuation training and safety meetings.

g. Inform Transient Aircrews of Local Bird Hazards. Transient crews are often unfamiliar with airfield hazards, including birds. This is well demonstrated by the fact that many bird strikes happen away from the home base and at some bases only the reportable bird strike incidents happen to transient aircraft. Information in the "Remarks" section of the FLIP IFR Enroute Supplement, use of NOTAMs, and broadcasting information on either Automatic Terminal Information Service (ATIS) or on initial radio contact with Approach Control or Tower can aid in informing the aircrew of potential hazards. The IFR Enroute Supplement can explain procedures for BIRD WATCH (defined later in this report), NOTAMs can identify problems of long duration (migration, bird roosts, heavy feeding on the airfield, control measures being used, etc.), and broadcasts on ATIS and from the Tower can provide information of an immediate nature.

h. Pilot Responsibility. Pilots must share the responsibility for detecting birds on the airfield and in the local flying vicinity. When pilots sight birds they should notify other pilots and the Control Tower so others can be aware of the hazard. Pilots can also help base personnel become aware of bird hazards by requesting bird hazard information from the Tower before takeoff or landing. These requests will remind Air Traffic Controllers to inspect for birds before authorizing aircraft movement.

i. Bird Hazard Warning Systems. Bird concentrations both in the local area and in regions where low-level sorties are flown should be tracked and pilots should be briefed on the potential hazards they may face on a particular mission. Several systems may facilitate these briefings.

(1) High Bird Risk Areas. The FLIP charts contain a map which depicts high seasonal bird densities in the U.K. Preflight safety briefings should include information about potential bird problems in these areas. The Royal Flight Map is posted in Base Operations at each of our U.K. bases. In addition to the information already posted on these maps, high bird concentrations could also be plotted to give aircrews an easily viewed warning of the potential hazards.

Birdtams give advance warnings of heavy bird migration on the European continent. These movements directly affect the bird populations in the U.K. Also, many of the missions flown from the U.K. go to Europe and would be directly affected by the bird movements in Europe. Base Operations currently receives Birdtams. Pertinent information available on Birdtams should be plotted on the Royal Flight Maps and briefed prior to each mission.

(2) BIRD WATCH. To assist in informing pilots of bird activities in the local area which require operational changes, the term BIRD WATCH should be used. Similar to a MET WATCH for severe weather, BIRD WATCH alerts aircrews to possible flight hazards due to increased bird activity. BIRD WATCH conditions should be incremental to reflect varying degrees of bird hazards. For example, BIRD WATCH Red would exist when large flocks of gulls or Lapwings congregate on the airfield. Aircraft departures and arrivals would be held until the birds are scared away. After the birds are clear of the airfield but still in the vicinity, BIRD WATCH Yellow conditions result. BIRD WATCH Green occurs when the area is clear of unusual bird activity. Operational changes for each BIRD WATCH condition would be defined by the BHWG. BIRD WATCH could be declared by the Chief Controller Supervisor of Flying, RSU, BCU or Air Traffic Control personnel. Pilots flying in the local area may also use BIRD WATCH to inform other pilots when birds are encountered.

5. Pest Bird and Mammal Reduction

Pest birds inhabit hangars and storage buildings in all of our U.K. bases. The most common problem species are the Pigeon, Woodpigeon, House Sparrow and Starling. Their droppings are caustic to equipment and aircraft and result in many wasted man-hours involved in otherwise unnecessary cleanup. An unaesthetic, unsanitary working environment is also detrimental to the morale of hangar personnel.

Documentation is the only means to justify pest bird control programs. The number of man-hours used cleaning up bird droppings must be recorded. Pest bird control must be justified on a cost-effective basis or a recognized health hazard before any program can be initiated. Several methods can be used with varying degrees of success and expense.

Several methods of bird control have been tried without success. Each method may be effective for a few days, but pigeons soon become habituated, and the techniques become useless. Stuffed owls, rotating and flashing lights, rubber snakes and various sounds are examples of some ineffective techniques. Before any method is tried, the BASH team should be consulted.

The most effective and permanent solution to the pest bird problem is exclusion of the birds from the building superstructure. It is not feasible to keep all doors to hangars closed. Two methods have been effective in keeping birds from roosting in large buildings. The most permanent solution to the problem is a plastic netting (Conwed 5/8 inch plastic netting made in Minneapolis, MN) used to create a false ceiling beneath the hangar superstructures. The netting denies birds access to roosting perches and has been found to meet Air Force fire protection standards. Several chemical repellents are available which can be spread on the hangar superstructures. These chemicals resemble a sticky gel and give birds a chemical "hot foot". One of the chemicals, Roost-No-More, has a national stock number, NSN 6840-559-1550. Both physical exclusion and chemical repellents are expensive programs and must be justified on a cost-effective basis by man-hour documentation.

The most practical short-term solution to the problem is a trapping program to be carried out by either the BCU or Entomology personnel. Plans for construction of these traps are included in this report (Appendix G). Pigeons, Woodpigeons and House Sparrows spend time on hangar roofs, making these locations ideal trapping areas. Before trapping, pre-bait with corn for at least two weeks. Every morning place fresh bait near traps, but not inside them. Remove excess grain

not consumed each day. After the birds begin feeding heavily in the area, place corn and water inside the trap. Remove trapped birds early in the morning and late in the afternoon and add fresh bait and water. Remove any bait not consumed from the previous day. Leave one or two healthy birds in the trap each day to act as decoys. Continue the trapping operation until there are no longer a significant number of birds being caught. Under British law, these pest birds described in this report are in the Second Schedule (Reference 7). They may be "killed or taken by authorized persons". Pest bird removal may be authorized by the Base Commander. Dispose of the birds as directed by the Base Veterinarian.

Pigeon numbers can be reduced by chasing the birds from the hangars and shooting them with shotguns as they fly out of the buildings. Number 6 bird shot should be used. This program creates safety problems, and considerable planning and coordination are necessary before using this method of pigeon control. Carried out over several days, shooting the birds will reduce the pigeon numbers. Careful use of pellet guns to shoot birds inside hangars also effectively reduce bird numbers. This is not a permanent solution; new pigeons will replace those shot, and the population will grow back to its original size.

The airfields have large rabbit and hare populations. These mammals are large enough to cause damage to aircraft when struck. They also attract birds of prey which use them as a food source. Considered vermin in the U.K., rabbits and hares are taken with poison, trapping and shooting. Large numbers of these animals in the surrounding community make total eradication impossible. Population control can be accomplished, however, with a trapping and shooting program. This is presently the responsibility of the Entomology Shop and was formerly done by the Falconer. The BCU could assume primary responsibility for the program.

The best way to reduce rabbit and hare populations is by hunting. The hunting should be done on a continual basis by members of the BCU. Security police coordination is required and approval by the Base Commander is essential. Hunting on a larger scale can take place through an organized hunt by base rod and gun clubs. This has been used effectively in the past to reduce pest populations, but safety problems may arise and the hunt must be closely coordinated with Security Police and the Base Commander. The hunt must be planned over a weekend or other period of minimal flying. During the hunt, the airfield should be closed to all but emergency aircraft movement.

BIBLIOGRAPHY

1. Brough, Trevor, Biologist, Ministry of Agriculture, Fisheries and Food, Surrey, U.K., personal communication, 1978.
2. Air Traffic Controllers, RAF Honnington, U.K., personal communication, 1978.
3. Blokpoel, Hans, Bird Hazards to Aircraft, Clarke Irwin Co., Canada, 1976.
4. Brough, T., and Bridgeman, C.J., "An Evaluation of Long Grass as a Bird Deterrent on British Airfields", unpublished research.
5. Airfield Bird Control, Directorate of Flight Safety, RAF, London, July 1977.
6. Eland, Warren Officer, RAF Fairford, personal communication, 1978.
7. "Wild Birds and the Law", The Royal Society for the Protection of Birds, The Lodge Sandy Bedfordshire, Sandy, 1978.

APPENDIX A
Longwings Contract

ITEM NO.		QUANTITY		UNIT PRICE		TOTAL PRICE	
1		100		1.00		100.00	
2		50		2.00		100.00	
3		25		4.00		100.00	
4		10		10.00		100.00	
5		5		20.00		100.00	
6		2		50.00		100.00	
7		1		100.00		100.00	
8		1		100.00		100.00	
9		1		100.00		100.00	
10		1		100.00		100.00	

STANDARD FORM 28, JULY 1966 GENERAL SERVICES ADMINISTRATION FPMR, 41 CFR, 101-11.6		AWARD/CONTRACT		See Table of Contents
1. CONTRACT (Proc. Inv. Ident.) NO F61775-78-C-0017		2. EFFECTIVE DATE 77 OCT 01		3. ISSUING/PURCHASING AGENCY/PROJECT NO. See Page 2
5. ISSUED BY USAFE Purchasing Region - UK Building 965, RAF Lakenheath Suffolk IP27 9PN		4. CERTIFIED FOR NATIONAL DEFENSE UNDER DDPA REG. 2 AND/OR DMS REG. 1. RATINGS		7. DELIVERY FOR DESTINATION <input checked="" type="checkbox"/> YES <input type="checkbox"/> OTHER (See below)
8. CONTRACTOR NAME AND ADDRESS Longwings Limited Heath Farm Great Moulton Norwich NR15 2HU		9. DISCOUNT FOR PROMPT PAYMENT 0.1% - 10 Calendar Days		10. SUBMIT INVOICES (4 copies unless otherwise specified) TO ADDRESS SHOWN IN BLOCK 12
11. SHIP TO/MARK FOR See paragraph 2 of Part II - Section "E" of the Schedule		12. PAYMENT WILL BE MADE BY See paragraph 2 of Part II - Section "K" of the Schedule		
13. THIS PROCUREMENT WAS <input type="checkbox"/> ADVERTISED <input checked="" type="checkbox"/> NEGOTIATED, PURSUANT TO <input checked="" type="checkbox"/> 10 U.S.C. 2304 (K) 6 U.S. Expenditures Nil <input type="checkbox"/> 41 U.S.C. 252 (K) 1		14. ACCOUNTING AND APPROPRIATION DATA To be provided upon notification of availability of funds. (\$ 379,724.93)		
15 ITEM NO	16 SUPPLIES/SERVICES	17 QUANTITY	18 UNIT	19 UNIT PRICE
20. AMOUNT				
TABLE OF CONTENTS (The following checked sections are contained in the contract)				
(E) Sec.	Page	(E) Sec.	Page	
PART I - GENERAL INSTRUCTIONS				
A	Cover Sheet	G	Preservation/Protecting/Packaging	
X B	Contract Form - SF 26	H	Deliveries or Performance	4
		I	Inspection and Acceptance	4
		J	Special Provisions	4-6
		K	Contract Administration Data	6
C	Solicitation Instructions and Conditions and Notices to Offerors	PART II - GENERAL PROVISIONS		
D	Evaluation for Award Factors	L	General Provisions CLAUSES 1-51	1-21
PART III - THE SCHEDULE				
X E	Supplies/Services and Prices	PART IV - LIST OF DOCUMENTS AND ATTACHMENTS		
X F	Responsibility/Performance	M	List of Documents, Exhibits and Other Attachments	
Contract for the provision of Falcons, handlers, materials and transportation to perform Airfield Bird Control service at RAF Alconbury, Upper Heyford, Lakenheath, Bentwaters, Woodbridge and Mildenhall. See Schedule Section "E"				
21. CONTRACTING OFFICER WILL COMPLETE BLOCK 22 OR 26 AS APPLICABLE				218,232.72
22. <input checked="" type="checkbox"/> CONTRACTOR'S NEGOTIATED AGREEMENT (Contractor is required to sign this document and return 2 copies to issuing office.) Contractor agrees to furnish and deliver all items or perform all the services set forth or otherwise identified above and on any continuation sheets for the consideration stated herein. The rights and obligations of the parties to this contract shall be subject to and governed by the following documents: (a) this award/contract, (b) the solicitation, if any, and (c) such provisions, representations, certifications, and specifications, as are attached or incorporated by reference herein. (Attachments are listed herein.)		26. <input type="checkbox"/> AWARD (Contractor is not required to sign this document.) Your offer on Solicitation Number _____, including the additions or changes made by you which additions or changes are set forth in full above, is hereby accepted as to the items listed above and on any continuation sheets. This award consummates the contract which consists of the following documents: (a) The Government's solicitation and your offer, and (b) this award/contract. No further contractual document is necessary.		
23. NAME OF CONTRACTOR BY A. R. Crosswell Longwings (Signature of person authorized to sign)		27. UNITED STATES OF AMERICA BY Lamar C. Capener (Signature of Contracting Officer)		
24. NAME AND TITLE OF SIGNER (Type or print) A. R. CROSSWELL (Director)		28. NAME OF CONTRACTING OFFICER (Type or print) LAMAR C. CAPENER		29. DATE SIGNED 77SEP/6
25. DATE SIGNED 77SEP/15				

PURCHASE REQUEST NUMBERS

Alconbury	F500116328
Upper Heyford	F9-5537-7143
Lakenheath	F500167139
Bentwaters/Woodbridge	OTB 78-01
Mildenhall	MIL-OTB-77-001

Contract No: F61775-78-C-0017
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PART II - SECTION "E"

SERVICES AND PRICES.

1. SCOPE.

Non-Personal service contract for the provision of an Airfield Bird Control service.

2. The Contractor shall provide falcons; handlers; materials (Except Government Furnished property specified in paragraph 5 of Part II - Section "J") and transportation necessary to perform at the following areas. Such services shall be provided in accordance with the terms of this contract at the following prices:

SCHEDULE OF PRICES

THREE YEAR MULTI-YEAR PROCUREMENT

77 Oct 01 through 80 Sep 30

<u>Item</u>	<u>Area</u>	<u>Unit</u>	<u>Quantity</u>	<u>Unit Price</u>	<u>Total Amount</u>
				<u>£</u>	<u>£</u>
0001	Alconbury	Calendar Year (7 days per week)	3 Years	12,835.44	38,506.32
0002	Upper Heyford	Calendar Year (7 days per week)	3 Years	12,835.44	38,506.32
0003	Lakenheath	Calendar Year (7 days per week)	3 Years	12,835.44	38,506.32
0004	Bentwaters	Calendar Year (5 days per week)	3 Years	10,701.24	32,103.72
0005	Woodbridge	Calendar Year (5 days per week)	3 Years	10,701.24	32,103.72
0006	Mildenhall	Calendar Year (7 days per week)	3 Years	12,835.44	38,506.32

THREE YEAR TOTAL AMOUNT . . £ 218,232.72

Note: Prices do not include the keep of dogs.

3 EXEMPTION OF VALUE ADDED TAX

a. The goods and/or services listed are to be delivered at a price exclusive of VAT under arrangements agreed between the appropriate U.S. authorities and H.M. Customs and Excise (Ref: PRIV 46/7). I hereby certify that these goods and/or services are being purchased for United States official purposes only.

b. The Contractor will inscribe the following statement on all invoices: "PRICES SHOWN HEREON ARE EXCLUSIVE OF VALUE ADDED TAX".

PART II - SECTION "F"

DESCRIPTION/SPECIFICATIONS

1. The Contractor shall provide falcons and handlers, in sufficient numbers, from sunrise to sunset to disperse and discourage birds from the vicinity of the runway areas.
2. Falcons and handlers, provided under the terms of this contract, shall be proficient and capable of taking appropriate action to sufficiently disperse bird populations and restrict the hazard of their colliding with low flying aircraft during take-off and landing.
3. The Contractor shall adopt techniques considered necessary to meet the various situations for combatting bird strikes. For this purpose he may additionally use noisemakers, shotguns and/or lights, provided however that any such methods are consistent with Air Force Regulations, concerning USAFE and Local Base Resource Protection Plan, and are performed with the approval of the Base Operations Officer.
4. The Contractor shall maintain close liaison with the Base Operations Officer to provide for the implementation of program procedures as a whole and to allow the Base Operations Officer to exercise sound judgement concerning approval/disapproval of additional methods desired by the Contractor.

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DELIVERIES OR PERFORMANCE

1. PERIOD OF CONTRACT

The period of this contract shall extend from 77 OCT 01 through 80 SEP 30 both dates inclusive unless sooner cancelled or terminated under the provisions of this contract.

2. SERVICE

The Contractor shall furnish service, as follows:

Alconbury)	
Mildenhall)	
Upper Heyford)	Continuously - Seven (7) days per week from
Lakenheath)	sunrise to sunset.
Bentwaters)	Continuously - Five (5) days per week, Monday through
Woodbridge)	Friday, from sunrise to sunset.

PART II - SECTION "I"

INSPECTION AND ACCEPTANCE

1. The Base Operations Officer, or his delegated representative, is designated the Contracting Officers' representative, at each activity listed below, and is assigned responsibility for performing surveillance and final inspection and for acceptance or non-acceptance of all services performed under the terms of this contract:

A. 10th Tactical Reconnaissance Wing	Alconbury
B. 20th Tactical Fighter Wing	Upper Heyford
C. 48th Tactical Fighter Wing	Lakenheath
D. 81st Tactical Fighter Wing	Bentwaters
E. 81st Tactical Fighter Wing	Woodbridge
F. 513th Tactical Airlift Wing	Mildenhall

2. The Base Operations Officer will be responsible for the monthly preparation of Receiving Reports (DD Form 250) and will make distribution of the original copy to the Accounting and Finance Officer, listed in paragraph 2 of Section "K".

PART II - SECTION "J"

1. INSTRUCTIONS BY UNAUTHORIZED THIRD PERSONS

Instructions given to the Contractor by any unauthorized US Military Officer, agent or employee of the US Military Authorities, before or after the Contractor has been served with the contract, will not affect any of the requirements of work therein contained. Any action on the part of the Contractor taken in compliance with such instructions other than those given by the Contracting Officer or his authorized representative, will not be grounds for subsequent payments for any work performed.

2. LIABILITY OF CONTRACTOR

The Contractor shall be responsible for, and hold the U.S. Government harmless from claims for bodily injury and/or death of persons occasioned either in whole or in part by the negligence of the Contractor, its officers, agents, or employees in the performance of work under this contract, except to the extent that any negligence or fault of the Government, its officers, agents or employees, contributes to such injury or death.

PART II - SECTION "J" (Cont'd)

3. SUBCONTRACTING

Subcontractors will not be employed under the terms of the contract unless approved in writing by the Contracting Officer.

4. RELIEF FROM DUTY

a. Pursuant to an agreement between the United States Government and Her Majesty's Customs and Excise, it is possible to obtain relief from Customs Duty on petrol and Fuel oils used in support of certain contracts. If vehicles and/or fuel oils are used in support of this contract, the Contractor will attempt to seek relief from Customs Duty in accordance with H.M. Customs Notice 431, "Relief from Customs Duty and/or Value Added Tax on United States Government Expenditures in the United Kingdom".

Application should be sent to:

H. M. Customs & Excise
International Customs
Division G Branch 4 (Privilege)
Adelaide House
London EC4R 9DB

Specific information should be included in the request for tax relief, i.e. number of vehicles involved, type of vehicles, rating of vehicles, petrol consumption, estimated mileage per contract period, and any other information which will assist H. M. Customs and Excise in determining the amount of relief, if any, which can be granted.

b. Within thirty (30) days after the award of this contract, the Contractor will provide the Contracting Officer with evidence that an attempt to obtain such relief has been initiated. In the event the Contractor does not attempt to obtain relief within the time specified, then the Contracting Officer may deduct from the contract price the amount of relief that would have been allowed if H. M. Customs and Excise had favorably considered the request for relief.

c. The amount of any rebate granted by H. M. Customs & Excise will be paid in full to the United States Government. Checks will be made payable to "Treasurer of the United States" and forwarded to the Contracting Officer.

5. GOVERNMENT FURNISHED PROPERTY

a. At each location (Airfield) the Government will furnish the Contractor with radio or telephone apparatus necessary for him to obtain prompt clearance for release of falcons.

b. At each location (Airfield) the Government will furnish the Contractor with a building of sufficient size to accommodate two (2) Falcon Handlers and approximately fifteen (15) falcons. Additionally two (2) Beds, Mattresses (no blankets or linen), one (1) Desk, two (2) Chairs and one (1) Refrigerator.

c. The Base Operations Officer will be responsible for taking possession of, and returning to store, all Government Furnished Property at the termination of this contract.

6. CANCELLATION

a. As contemplated in the General Provision entitled "CANCELLATION OF ITEMS - SERVICE CONTRACTS" cancellation ceilings are set forth below which will not be exceeded in the event of cancellation of one or more program years pursuant to the referenced provision. The first program year is not subject to cancellation.

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- b. The cancellation ceiling for the second or third program years shall not exceed 6.7% for the second program year (78 Oct 01 through 79 Sep 30) and 3.3% for the third program year (79 Oct 01 through 80 Sep 30).

PART II SECTION "K"

CONTRACT ADMINISTRATION DATA

1. OFFICE OF CONTRACT ADMINISTRATION

The Administrative Contracting Officer is assigned overall administrative responsibility for this contract and is located at:

USAF Purchasing Region-UK/LGPK
Bldg. 965, RAF Lakenheath,
Suffolk.

Tel. No: Eriswell 3131, Ext. 3735 or 2435

2. INVOICES AND PAYMENTS

a. The Contractor will be paid monthly in arrears upon the submission of properly certified invoices at the prices stipulated herein. Invoices shall be typed or printed and be submitted in accordance with Clause 19, "INVOICES" of the General Provisions, to be the respective Accounting and Finance Officer listed below.

b. Payment will be made, in accordance with Clause 3, "PAYMENTS" of the General Provisions, by the Accounting and Finance Officer, listed below.

<u>Location</u>	<u>Invoices to, and payment by, the Accounting and Finance Officer:</u>
Alconbury	10th Tactical Reconnaissance Wing, RAF Alconbury, Cambridgeshire.
Upper Heyford	20th Tactical Fighter Wing, RAF Upper Heyford, Oxfordshire.
Lakenheath	18th Tactical Fighter Wing, RAF Lakenheath, Suffolk.
Bentwaters)	41st Tactical Fighter Wing, RAF Bentwaters, Suffolk.
Woodbridge)	
Mildenhall	48th Tactical Fighter Wing, RAF Lakenheath, Suffolk.

c. The Contractor will inscribe the following statement on all invoices: "PRICES SHOWN HEREON ARE EXCLUSIVE OF VALUE ADDED TAX".

Note: The monthly amount payable shall be one twelfth of the annual figure, shown in Part II - Section "E" of the Schedule.

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GENERAL PROVISIONS

FIXED PRICE SUPPLY AND NON-PERSONAL SERVICE CONTRACTS

INDEX OF CLAUSES

- | | |
|--|--|
| 1. Definitions (1965-E Jun) | 15. Reporting of Royalties (Foreign) (1966 Oct) |
| 2. Extras (1949 Jul) | 16. Gratuities (1952 Mar) |
| 3. Payments (1965-E Jun) | 17. Authorization to Perform (1965-E Jun) |
| 4. Assignment of Claims (1965-E Jun) | 18. Subcontracting - First Tier (1972-E Jun) |
| 5. Additional Bond Security (1949 Jul) | 19. Invoices (1965-E Jun) |
| 6. Taxes (1967-E Jul) | 20. Examination of Records by Comptroller General (1975 Jun) |
| 7. Default (1969 Aug) | 21. Audit by Department of Defense (1975 Jun) |
| 8. Disputes | 22. Interest (1972 May) |
| 9. Renegotiation (1961 Jan) | 23. Payment of Interest on Contractors' Claims (1972 May) |
| 10. Rhodesia and Certain Communist Areas (1974 Nov) | 24. Inconsistency Between English Version and Translation of Contract (1966 Apr) |
| 11. United States Officials Not to Benefit (1965-E Jun) | |
| 12. Covenant Against Contingent Fees (1958 Jan) | |
| 13. Termination for Convenience of the Government (1974 Oct) | |
| 14. Pricing of Adjustments (1970 Jul) | |

IN ADDITION TO CLAUSES NUMBERED 1 THROUGH 24, THE CLAUSES NUMBERED 25 THROUGH 30 APPLY IF THE CONTRACT IS DESIGNATED AS A SUPPLY CONTRACT.

- ~~25. Changes (1958 Jan)~~
~~26. Variation in Quantity (1949 Jul)~~
~~27. Inspection (1958 May)~~
~~28. Title and Risk of Loss (1968 Jun)~~
~~29. Discounts (1968 Jun)~~
30. Responsibility for Inspection (1968 Sep)

IN ADDITION TO CLAUSES NUMBERED 1 THROUGH 24, CLAUSES NUMBERED 31 THROUGH 33 APPLY IF THE CONTRACT IS DESIGNATED AS A NONPERSONAL SERVICE CONTRACT.

31. Changes (1971 Nov)
32. Inspection of Services (1971 Nov)
33. Discounts (1971 Nov)

1. DEFINITIONS (1965-E Jun)

As used throughout this contract, the following terms shall have the meanings set forth below:

(a) The term "head of the agency" or "Secretary" means the Secretary, the Under Secretary, any Assistant Secretary, or any other head or assistant head of the United States executive or United States military department or other United States Federal agency; and the term "his duly authorized representative" means any person or persons or board (other than the Contracting Officer) authorized to act for the head of the agency or the Secretary.

(b) The term "Contracting Officer" means the person executing this contract on behalf of the Government, and any other officer or civilian employee who is a properly designated Contracting Officer; and the term includes, except as otherwise provided in this contract, the authorized representative of a Contracting Officer acting within the limits of his authority.

(c) Except as otherwise provided in this contract, the term "subcontracts" includes purchase orders under this contract.

(d) The term "Government" means the Government of the United States of America.

2. EXTRAS (1949 Jul)

Except as otherwise provided in this contract, no payment for extras shall be made unless such extras and the price therefor have been authorized in writing by the Contracting Officer.

3. PAYMENTS (1965-E Jun)

The Contractor shall be paid, upon the submission of proper invoices or vouchers, the prices stipulated herein for supplies delivered and accepted or services rendered and accepted, less deductions, if any, as herein provided. Unless otherwise specified, payment will be made on partial deliveries accepted by the Government when the

amount due on such deliveries so warrants; or when requested by the Contractor, payment for accepted partial deliveries shall be made whenever such payment would equal or exceed either \$1000 or an equivalent amount of local currency, or 50 percent of the total amount of this contract.

4. ASSIGNMENT OF CLAIMS (1965-E Jun)

(a) No claims for monies due or to become due shall be assigned by the Contractor unless (i) approved in writing by the Contracting Officer; (ii) made in accordance with the laws and regulations of the United States of America; and (iii) permitted by the laws and regulations of the Contractor's country.

(b) In no event shall copies of this contract or of any plans, specifications, or other similar documents relating to work under this contract, if marked "Top Secret", "Secret", or "Confidential", be furnished to any assignee of any claim arising under this contract or to any other person not entitled to receive the same. However, a copy of any part or all of this contract so marked may be furnished, or any information contained therein may be disclosed, to such assignee upon the prior written authorization of the Contracting Officer.

(c) Any assignment under this contract shall cover all amounts payable under this contract and not already paid, and shall not be made to more than one party, except that any such assignment may be made to one party as agent or trustee for two or more parties participating in such financing. On each invoice or voucher submitted for payment under this contract to which any assignment applies and for which direct payment thereof is to be made to an assignee, the Contractor shall identify the assignee by name and complete address and shall acknowledge the validity of the assignment and the right of the named assignee to receive payment in the amount invoiced or

vouchered.

**5. ADDITIONAL BOND SECURITY
(1949 Jul)**

If any surety upon any bond furnished in connection with this contract becomes unacceptable to the Government, or if any such surety fails to furnish reports as to his financial condition from time to time as requested by the Government, the Contractor shall promptly furnish such additional security as may be required from time to time to protect the interests of the Government and of persons supplying labor or materials in the prosecution of the work contemplated by this contract.

6. TAXES (1967-E Jul)

(a) The contract price, including the prices in any subcontracts hereunder, does not include any tax, duty, or other public charge which by law, regulation or governmental agreement is not applicable to expenditures made by the United States, or on its behalf; or any tax, duty, or other public charge from which the Contractor, or any subcontractor hereunder, is exempt by law, regulation or otherwise. If any such tax, duty or other public charge has been included in the contract price, through error or otherwise, the contract price shall be correspondingly reduced.

(b) If for any reasons after the contract date of execution the Contractor or subcontractor is relieved in whole or in part from the payment or the burden of any tax, duty or other public charge included in the contract price, the contract price shall be correspondingly reduced; or if the Contractor or a subcontractor is required to pay in whole or in part any tax, duty or other public charge which was not included in the contract price and which was not applicable at the contract date of execution the con-

tract price shall be correspondingly increased.

7. DEFAULT (1969 Aug)

(a) The Government may, subject to the provisions of paragraph (c) below, by written notice of default to the Contractor, terminate the whole or any part of this contract in any one of the following circumstances:

(i) if the Contractor fails to make delivery of the supplies or to perform the services within the time specified herein or any extension thereof; or

(ii) if the Contractor fails to perform any of the other provisions of this contract, or so fails to make progress as to endanger performance of this contract in accordance with its terms, and in either of these two circumstances does not cure such failure within a period of 10 days (or such longer period as the Contracting Officer may authorize in writing) after receipt of notice from the Contracting Officer specifying such failure.

(b) In the event the Government terminates this contract in whole or in part as provided in paragraph (a) of this clause, the Government may procure, upon such terms and in such manner as the Contracting Officer may deem appropriate, supplies or services similar to those so terminated, and the Contractor shall be liable to the Government for any excess costs for such similar supplies or services; provided, that the Contractor shall continue the performance of this contract to the extent not terminated under the provisions of this clause.

(c) Except with respect to defaults of subcontractors, the Contractor shall not be liable for any excess costs if the failure to perform the contract arises out of causes beyond the control and without the fault or negligence of the Contractor. Such causes may include, but are not restricted to, acts of God or of the public enemy, acts of the Government in either its sovereign or contractual capacity,

fires, floods, epidemics, quarantine restrictions, strikes, freight embargoes, and unusually severe weather; but in every case the failure to perform must be beyond the control and without the fault or negligence of the Contractor. If the failure to perform is caused by the default of a subcontractor, and if such default arises out of causes beyond the control of both the Contractor and subcontractor, and without the fault or negligence of either of them, the Contractor shall not be liable for any excess costs for failure to perform, unless the supplies or services to be furnished by the subcontractor were obtainable from other sources in sufficient time to permit the Contractor to meet the required delivery schedule.

(d) If this contract is terminated as provided in paragraph (a) of this clause, the Government, in addition to any other rights provided in this clause, may require the Contractor to transfer title and deliver to the Government, in the manner and to the extent directed by the Contracting Officer, (i) any completed supplies, and (ii) such partially completed supplies and materials, parts, tools, dies, jigs, fixtures, plans, drawings, information, and contract rights (hereinafter called "manufacturing materials") as the Contractor has specifically produced or specifically acquired for the performance of such part of this contract as has been terminated; and the Contractor shall, upon direction of the Contracting Officer, protect and preserve property in the possession of the Contractor in which the Government has an interest. Payment for completed supplies delivered to and accepted by the Government shall be at the contract price. Payment for manufacturing materials delivered to and accepted by the Government and for the protection and preservation of

property shall be in an amount agreed upon by the Contractor and Contracting Officer; failure to agree to such amount shall be a dispute concerning a question of fact within the meaning of the clause of this contract entitled "Disputes". The Government may withhold from amounts otherwise due the Contractor for such completed supplies or manufacturing materials such sum as the Contracting Officer determines to be necessary to protect the Government against loss because of outstanding liens or claims of former lien holders.

(e) If, after notice of termination of this contract under the provisions of this clause, it is determined for any reason that the Contractor was not in default under the provisions of this clause, or that the default was excusable under the provisions of this clause, the rights and obligations of the parties shall, if the contract contains a clause providing for termination for convenience of the Government, be the same as if the notice of termination had been issued pursuant to such clause. If, after notice of termination of this contract under the provisions of this clause, it is determined for any reason that the Contractor was not in default under the provisions of this clause, and if this contract does not contain a clause providing for termination for convenience of the Government, the contract shall be equitably adjusted to compensate for such termination and the contract modified accordingly; failure to agree to any such adjustment shall be a dispute concerning a question of fact within the meaning of the clause of this contract entitled "Disputes".

(f) The rights and remedies of the Government provided in this clause shall not be exclusive and are in addition to any other rights and remedies provided by law or under this con-

tract.

(g) As used in paragraph (c) of this clause, the terms "subcontractor" and "subcontractors" mean subcontractor(s) at any tier.

8. DISPUTES - See Additional General Provisions.

9. RENEGOTIATION (1961 Jan)

(a) This contract will be exempt from the provisions of the Renegotiation Act of 1951 (50 U.S.C. App. 1211, et seq.), as amended, if it is wholly performed outside the United States, its possessions and Puerto Rico and if throughout the performance of the contract the Contractor is not engaged in a trade or business in the United States, its possessions and Puerto Rico and is:

(i) an individual who is not a national of the United States; or

(ii) a partnership or joint venture in which individuals who are not nationals of the United States or corporations which are not created by, or organized under the laws of the United States or any state or possession thereof or Puerto Rico are entitled to more than 50 per cent of the profits; or

(iii) a corporation (other than a corporation created by, or organized under the laws of the United States or any state or possession thereof or Puerto Rico) more than 50 per cent of the voting stock of which is owned directly or indirectly by persons described in (i) and (ii) above.

(b) If the Contractor does not meet all the requirements for exemption set forth in paragraph (a) above at all times during the entire performance of this contract, this contract shall be subjected, to the extent required by law, to the Renegotiation Act of 1951, as

amended, and to any subsequent Act of the United States Congress providing for the renegotiation of contracts; provided, however, that nothing contained in this clause shall impose any renegotiation obligation with respect to this contract or any subcontract hereunder which is not imposed by an Act of the United States Congress heretofore or hereafter enacted. In the event this contract is subject to the Renegotiation Act of 1951, it shall be deemed to contain all the provisions required by Section 104 of that Act, and by any such other Act, without subsequent contract amendment specifically incorporating such provisions.

(c) The Contractor agrees to insert the provisions of this clause, including this paragraph (c) in all subcontracts, as that term is defined in Section 103g of the Renegotiation Act of 1951, as amended.

10. RHODESIA AND CERTAIN COMMUNIST AREAS (1974 Nov)

(a) Unless he first obtains the written approval of the Contracting Officer, the Contractor shall not acquire for use in the performance of this contract:

(i) any supplies or services originating from sources within Rhodesia (except chrome) and the communist areas of North Korea, North Vietnam, or Cuba;

(ii) any supplies, however processed, which are or were located in or transported from or through North Korea, North Vietnam, or Cuba.

(b) The Contractor agrees to insert the provisions of this clause, including this paragraph (b), in all subcontracts hereunder.

11. UNITED STATES OFFICIALS NOT TO BENEFIT (1965-E Jun)

No member of or delegate to the Congress of the United States

of America, or resident commissioner of the United States of America, shall be admitted to any share or part of this contract, or to any benefit that may arise therefrom; but this provision shall not be construed to extend to this contract if made with a corporation for its general benefit.

12. COVENANT AGAINST CONTINGENT FEES (1958 Jan)

The Contractor warrants that no person or selling agency has been employed or retained to solicit or secure this contract upon an agreement or understanding for a commission, percentage, brokerage, or contingent fee, excepting bona fide employees, or bona fide established commercial or selling agencies maintained by the Contractor for the purpose of securing business. For breach or violation of this warranty the Government shall have the right to annul this contract without liability or in its discretion, to deduct from the contract price or consideration, or otherwise recover, the full amount of such commission, percentage, brokerage or contingent fee.

13. TERMINATION FOR CONVENIENCE OF THE GOVERNMENT (1974 Oct)

(a) The performance of work under this contract may be terminated by the Government in accordance with this clause in whole, or from time to time in part, whenever the Contracting Officer shall determine that such termination is in the best interest of the Government. Any such termination shall be effected by delivery to the Contractor of a Notice of Termination specifying the extent to which performance of work under the contract is terminated, and the date upon which such termination becomes effective.

(b) After receipt of a Notice of Termination, and ex-

cept as otherwise directed by the Contracting Officer, the Contractor shall;

(i) stop work under the contract on the date and to the extent specified in the Notice of Termination;

(ii) place no further orders or subcontracts for materials, services or facilities, except as may be necessary for completion of such portion of the work under the contract as is not terminated;

(iii) terminate all orders and subcontracts to the extent that they relate to the performance of work terminated by the Notice of Termination;

(iv) assign to the Government in the manner, at the times, and to the extent directed by the Contracting Officer, all of the right, title, and interest of the Contractor under the orders and subcontracts so terminated, in which case the Government shall have the right, in its discretion, to settle or pay any or all claims arising out of the termination of such orders and subcontracts;

(v) settle all outstanding liabilities and all claims arising out of such termination of orders and subcontracts, with the approval or ratification of the Contracting Officer, to the extent he may require, which approval or ratification shall be final for all the purposes of this clause;

(vi) transfer title and deliver to the Government, in the manner, at the times, and to the extent, if any, directed by the Contracting Officer, (A) the fabricated or unfabricated parts, work in process, completed work, supplies, and other material produced as a part of, or acquired in connection with the performance of, the work terminated by the Notice of Termination, and (B) the completed or partially completed plans, drawings, information, and other property which,

if the contract had been completed, would have been required to be furnished to the Government.

(vii) use his best efforts to sell, in the manner, at the times, to the extent, and at the price or prices directed or authorized by the Contracting Officer, any property of the types referred to in (vi) above; provided, however, that the Contractor (A) shall not be required to extend credit to any purchaser, and (B) may acquire any such property under the conditions prescribed by and at a price or prices approved by the Contracting Officer; and provided further that the proceeds of any such transfer or disposition shall be applied in reduction of any payments to be made by the Government to the Contractor under this contract or shall otherwise be credited to the price or cost of the work covered by this contract or paid in such other manner as the Contracting Officer may direct;

(viii) complete performance of such part of the work as shall not have been terminated by the Notice of Termination; and

(ix) take such action as may be necessary, or as the Contracting Officer may direct, for the protection and preservation of the property related to this contract which is in the possession of the Contractor and in which the Government has or may acquire an interest. At any time after expiration of the plant clearance period, as defined in Section VIII, Armed Services Procurement Regulation, as it may be amended from time to time, the Contractor may submit to the Contracting Officer a list, certified as to quantity and quality, of any or all items of termination inventory not previously disposed of, exclusive of items the disposition of which has been directed or authorized by the Contracting Officer, and

may request the Government to remove such items or enter into a storage agreement covering them. Not later than fifteen (15) days thereafter, the Government will accept title to such items and remove them or enter into a storage agreement covering the same; provided, that the list submitted shall be subject to verification by the Contracting Officer upon removal of the items, or if the items are stored, within fortyfive (45) days from the date of submission of the list, and any necessary adjustment to correct the list as submitted shall be made prior to final settlement.

(c) After receipt of a Notice of Termination, the Contractor shall submit to the Contracting Officer his termination claim, in the form and with certification prescribed by the Contracting Officer. Such claim shall be submitted promptly but in no event later than one year from the effective date of termination, unless one or more extensions in writing are granted by the Contracting Officer, upon request of the Contractor made in writing within such one year period or authorized extension thereof. However, if the Contracting Officer determines that the facts justify such action, he may receive and act upon any such termination claim at any time after such one year period or any extension thereof. Upon failure of the Contractor to submit his termination claim within the time allowed, the Contracting Officer may determine, on the basis of information available to him, the amount, if any, due to the Contractor by reason of the termination and shall thereupon pay to the Contractor the amount so determined.

(d) Subject to the provisions of paragraph (c), the Contractor and the Contracting Officer may agree upon the whole or any part of the amount or amounts to be paid to the Contractor by reason of the total or partial termination of work pursuant to this clause, which amount or amounts may include a reasonable allowance for

profit on work done; provided, that such agreed amount or amounts, exclusive of settlement cost, shall not exceed the total contract price as reduced by the amount of payments otherwise made and as further reduced by the contract price of work not terminated. The contract shall be amended accordingly, and the Contractor shall be paid the agreed amount. Nothing in paragraph (e) of this clause, prescribing the amount to be paid to the Contractor in the event of failure of the Contractor and the Contracting Officer to agree upon the whole amount to be paid to the Contractor by reason of the termination of work pursuant to this clause, shall be deemed to limit, restrict, or otherwise determine or affect the amount or amounts which may be agreed upon to be paid to the Contractor pursuant to this paragraph (d).

(e) In the event of the failure of the Contractor and the Contracting Officer to agree as provided in paragraph (d) upon the whole amount to be paid to the Contractor by reason of the termination of work pursuant to this clause, the Contracting Officer shall pay to the Contractor the amounts determined by the Contracting Officer, as follows, but without duplication of any amounts agreed upon in accordance with paragraph (d):

(i) for completed supplies or services accepted by the Government (or sold or acquired as provided in paragraph (b) (vii) above) and not theretofore paid for, a sum equivalent to the aggregate price for such supplies or services computed in accordance with the price or prices specified in the contract, appropriately adjusted for any saving of freight or other charges:

(ii) the total of-

(A) the costs incurred in the performance of the work terminated, including initial costs and preparatory expense allocable thereto, but exclusive

of any costs attributable to supplies or services paid or to be paid for under paragraph (e) (i) hereof;

(B) the cost of settling and paying claims arising out of the termination of work under subcontracts or orders, as provided in paragraph (b) (v) above, which are properly chargeable to the terminated portion of the contract (exclusive of amounts paid or payable on account of supplies or materials delivered or services furnished by subcontractors or vendors prior to the effective date of the Notice of Termination, which amounts shall be included in the costs payable under (A) above; and

(C) a sum, as profit on (A) above, determined by the Contracting Officer pursuant to 8-303 of the Armed Services Procurement Regulation, in effect as of the date of execution of this contract, to be fair and reasonable; provided, however, that if it appears that the Contractor would have sustained a loss on the entire contract had it been completed, no profit shall be included or allowed under this subdivision (C) and an appropriate adjustment shall be made reducing the amount of the settlement to reflect the indicated rate of loss; and

(iii) the reasonable costs of settlement, including accounting, legal, clerical, and other expenses reasonably necessary for the preparation of settlement claims and supporting data with respect to the terminated portion of the contract and for the termination and settlement of subcontract thereunder, together with reasonable storage, transportation, and other costs incurred in connection with the protection or disposition of property allocable to this contract.

The total sum to be paid to the Contractor under (i) and (ii) of this paragraph (e) shall not exceed the total contract price as reduced by the amount of payments otherwise made and as further reduced by the contract

price of work not terminated. Except for normal spoilage, and except to the extent that the Government shall have otherwise expressly assumed the risk of loss, there shall be excluded from the amounts payable to the Contractor as provided in (e) (i) and (ii)(A) above, the fair value, as determined by the Contracting Officer, of property which is destroyed, lost, stolen, or damaged so as to become undeliverable to the Government, or to a buyer pursuant to paragraph (b)(vii).

(f) Costs claimed, agreed to, or determined pursuant to (c), (d), (e), and (i) hereof shall be in accordance with Section XV of the Armed Services Procurement Regulation as in effect on the date of this contract.

(g) The Contractor shall have the right of appeal, under the clause of this contract entitled "Disputes", from any determination made by the Contracting Officer under paragraph (c), (e), or (i) hereof, except that if the Contractor has failed to submit his claim within the time provided in paragraph (c) or (i) hereof, and has failed to request extension of such time, he shall have no such right of appeal. In any case where the Contracting Officer has made a determination of the amount due under paragraph (c), (e) or (i) hereof, the Government shall pay to the Contractor the following: (i) if there is no right of appeal hereunder or if no timely appeal has been taken, the amount so determined by the Contracting Officer, or (ii) if an appeal has been taken, the amount finally determined on such appeal.

(h) In arriving at the amount due the Contractor under this clause there shall be deducted (i) all unliquidated advance or other payments on account theretofore made to the Contractor, applicable to the termination portion of this contract, (ii) any claim which the Government

may have against the Contractor in connection with this contract, and (iii) the agreed price for, or the proceeds of sale of, any materials, supplies, or other things acquired by the Contractor or sold, pursuant to the provisions of this clause, and not otherwise recovered by or credited to the Government.

(i) If the termination hereunder be partial, the Contractor may file with the Contracting Officer a claim for an equitable adjustment of the price or prices specified in the contract relating to the continued portion of the contract (the portion not terminated by the Notice of Termination) and such equitable adjustment as may be agreed upon shall be made in such price or prices. Any claim by the Contractor for an equitable adjustment under this clause must be asserted within ninety (90) days from the effective date of the termination notice, unless an extension is granted in writing by the Contracting Officer.

(j) The Government may from time to time, under such terms and conditions as it may prescribe, make partial payments and payments on account against costs incurred by the Contractor in connection with the terminated portion of this contract whenever in the opinion of the Contracting Officer the aggregate of such payments shall be within the amount to which the Contractor will be entitled hereunder. If the total of such payments is in excess of the amount finally agreed or determined to be due under this clause, such excess shall be payable by the Contractor to the Government upon demand, together with interest computed at the rate established by the Secretary of the Treasury pursuant to Public Law 92-41; 85 STAT 97 for the Renegotiation Board, for the period from the date such excess payment is received by the Contractor to the date on which such excess is repaid to the Government; provided, however, that no interest shall be charged with respect to any such excess

payment attributable to a reduction in the Contractor's claim by reason of retention or other disposition of termination inventory until ten days after the date of such retention or disposition, or such later date as determined by the Contracting Officer by reason of the circumstances.

(k) Unless otherwise provided for in this contract, or by applicable statute, the Contractor shall - from the effective date of termination until the expiration of three years after final settlement under this contract - preserve and make available to the Government at all reasonable times at the office of the Contractor but without direct charge to the Government, all his books, records, documents and other evidence bearing on the costs and expenses of the Contractor under this contract and relating to the work terminated hereunder, or, to the extent approved by the Contracting Officer, photographs, microphotographs, or other authentic reproductions thereof.

14. PRICING OF ADJUSTMENTS (1970 Jul)

When costs are a factor in any determination of a contract price adjustment pursuant to the "Changes" clause or any other provision of this contract, such costs shall be in accordance with Section XV of the Armed Services Procurement Regulation as in effect on the date of this contract.

15. REPORTING OF ROYALTIES (FOREIGN) (1966 Oct)

(a) If this contract is in an amount which exceeds fifty thousand United States dollars (\$50,000), the Contractor shall report in writing to the Contracting Officer during the performance of this contract the amount of royalties paid or to be paid by the Contractor directly to others in the performance of this contract. The Con-

tractor shall also (i) furnish in writing any additional information relating to such royalties as may be requested by the Contracting Officer, and (ii) insert a provision similar to this clause in any subcontract hereunder which involves an amount in excess of the equivalent of fifty thousand United States dollars (\$50,000).

(b) The term "royalties" as used herein refers to any costs or charges in the nature of royalties, license fees, patent or license amortization costs, or the like for the use of or for rights in patents or patent applications.

16. GRATUITIES (1952 Mar)

(a) The Government may, by written notice to the Contractor, terminate the right of the Contractor to proceed under this contract if it is found, after notice and hearing, by the Secretary or his duly authorized representative, that gratuities (in the form of entertainment, gifts, or otherwise) were offered or given by the Contractor, or any agent or representative of the Contractor, to any officer or employee of the Government with a view toward securing a contract or securing favorable treatment with respect to the awarding or amending, or the making of any determinations with respect to the performing of such contract; provided, that the existence of the facts upon which the Secretary or his duly authorized representative makes such findings shall be in issue and may be reviewed in any competent court.

(b) In the event this contract is terminated as provided in paragraph (a) hereof, the Government shall be entitled (i) to pursue the same remedies against the Contractor as it could pursue in the event of a breach of the contract by the Contractor, and (ii) as a penalty in addition to any other damages to which it may be entitled by law, to exemplary damages in an amount (as determined by the Secretary or his duly authorized

representative) which shall be not less than three nor more than ten times the costs incurred by the Contractor in providing any such gratuities to any such officer or employee.

(c) The rights and remedies of the Government provided in this clause shall not be exclusive and are in addition to any other rights and remedies provided by law or under this contract.

17. AUTHORIZATION TO PERFORM
(1965-E Jun)

The Contractor warrants that he has been duly authorized to operate and do business in the country or countries in which this contract is to be performed; that he has obtained, at no cost to the United States Government, all necessary licenses and permits required in connection with this contract; and that he will fully comply with all the laws, decrees, labor standards and regulations of such country or countries during the performance of this contract.

18. SUBCONTRACTING - FIRST
TIER (1972-E Jun)

The Contractor shall not, without the prior written consent of the Contracting Officer, place any subcontract hereunder with amounts to \$100,000 or more, or which, together with current subcontracts with the same subcontractor, will aggregate \$100,000 or more.

19. INVOICES (1965-E Jun)

Invoices shall be prepared and submitted in quadruplicate unless otherwise specified and shall contain: Contract number; order number (if any); item number; contract description of supplies or services; size; quantities; unit prices (exclusive of taxes or duties for which relief is available); and extended totals. Bill of Lading or Freight Warrant number and weight of shipment shall be

shown for shipments on U.S. Government Bills of Lading or Freight Warrants.

20. EXAMINATION OF RECORDS BY
COMPTROLLER GENERAL
(1975 Jun)

(a) This clause is applicable if the amount of this contract exceeds \$10,000 and was entered into by means of negotiation, including small business restricted advertising, but is not applicable if this contract was entered into by means of formal advertising.

(b) The Contractor agrees that the Comptroller General of the United States or any of his duly authorized representatives shall, until the expiration of three years after final payment under this contract or such lesser time specified in either Appendix M of the Armed Services Procurement Regulation or the Federal Procurement Regulations Part 1-20, as appropriate, have access to and the right to examine any directly pertinent books, documents, papers, and records of the Contractor involving transactions related to this contract.

(c) The Contractor further agrees to include in all his subcontracts hereunder a provision to the effect that the subcontractor agrees that the Comptroller General of the United States or any of his duly authorized representatives shall, until the expiration of three years after final payment under the subcontract or such lesser time specified in either Appendix M of the Armed Services Procurement Regulation or the Federal Procurement Regulations Part 1-20, as appropriate, have access to and the right to examine any directly pertinent books, documents, papers, and records of such subcontractor, involving transactions related to the subcontract. The term "subcontract" as used in this clause excludes (i) purchase orders not exceeding \$10,000 (ii) subcontracts or purchase orders for public utility

services at rates established for uniform applicability to the general public.

(d) The periods of access and examination described in (b) and (c) above for records which relate to (i) appeals under the "Disputes" clause of this contract, (ii) litigation or the settlement of claims arising out of the performance of this contract, or (iii) costs and expenses of this contract as to which exception has been taken by the Comptroller General or any of his duly authorized representatives, shall continue until such appeals, litigation, claims or exceptions have been disposed of.

21. AUDIT BY DEPARTMENT OF DEFENSE (1975 Jun)

(a) General. The Contracting Officer or his representatives shall have the audit and inspection rights described in the applicable paragraphs (b), (c), and (d) below.

(b) Examination of Costs. If this is a cost reimbursement type, incentive, time and materials, labor hour, or price redeterminable contract, or any combination thereof, the Contractor shall maintain, and the Contracting Officer or his representatives shall have the right to examine books, records, documents, and other evidence and accounting procedures and practices, sufficient to reflect properly all direct and indirect cost of whatever nature claimed to have been incurred and anticipated to be incurred for the performance of this contract. Such right of examination shall include inspection at all reasonable times of the Contractor's plants, or such parts thereof, as may be engaged in the performance of this contract.

(c) Cost or Pricing Data. If the Contractor submitted cost or pricing data in connection with the pricing of this contract or any change or modification thereto, unless such

pricing was based on adequate price competition, established catalog or market prices of commercial items sold in substantial quantities to the general public, or prices set by law or regulation, the Contracting Officer or his representatives who are employees of the United States Government shall have the right to examine all books, records, documents and other data of the Contractor related to the negotiation, pricing or performance of such contract, change or modification, for the purpose of evaluating the accuracy, completeness and currency of the cost or pricing data submitted. Additionally, in the case of pricing any change or modification exceeding \$100,000 to formally advertised contracts, the Comptroller General of the United States or his representatives who are employees of the United States Government shall have such rights. The right of examination shall extend to all documents necessary to permit adequate evaluation of the cost or pricing data submitted, along with the computations and projections used therein.

(d) Reports. If the Contractor is required to furnish Cost Information Reports (CIR) or Contract Fund Status Reports (CFSR), the Contracting Officer or his representatives shall have the right to examine books, records, documents, and supporting materials, for the purpose of evaluating (i) the effectiveness of the Contractor's policies and procedures to produce data compatible with the objectives of these reports, and (ii) the data reported.

(e) Availability. The materials described in (b), (c) and (d) above shall be made available at the office of the Contractor, at all reasonable times, for inspection, audit, or reproduction, until the expiration of three years from the date of final payment under this contract or such lesser time specified in Appendix M of the Armed Services Procurement Regulation, and for such longer period, if any, as is required

by applicable statute, or by other clauses of this contract, or by (1) and (2) below:

(1) If this contract is completely or partially terminated, the records relating to the work terminated shall be made available for a period of three years from the date of any resulting final settlement.

(2) Records which relate to appeals under the "Disputes" clause of this contract, or litigation or the settlement of claims arising out of the performance of this contract, shall be made available until such appeals, litigation, or claims have been disposed of.

(f) The Contractor shall insert a clause containing all the provisions of this clause, including this paragraph (f), in all subcontracts exceeding \$10,000 hereunder, except altered as necessary for proper identification of the contracting parties and the Contracting Officer under the Government prime contract.

22. INTEREST (1972 May)

Notwithstanding any other provisions of this contract, unless paid within 30 days all amounts that become payable by the Contractor to the Government under this contract (net of any applicable tax credit under the Internal Revenue Code) shall bear interest from the date due until paid and shall be subject to adjustments as provided by Part 6 of Appendix E of the Armed Services Procurement Regulation, as in effect on the date of this contract. The interest rate per annum shall be the interest rate in effect which has been established by the Secretary of the Treasury pursuant to Public Law 92-41; 85 STAT 97 for the Renegotiation Board, as of the date the amount becomes due as

herein provided. Amounts shall be due upon the earliest one of (i) the date fixed pursuant to this contract; (ii) the date of the first written demand for payment, consistent with this contract, including demand consequent upon default termination; (iii) the date of transmittal by the Government to the Contractor of a proposed supplemental agreement to confirm completed negotiations fixing the amount; or (iv) if this contract provides for revision of prices, the date of written notice to the Contractor stating the amount of refund payable in connection with a pricing proposal or in connection with a negotiated pricing agreement not confirmed by contract supplement.

23. PAYMENT OF INTEREST ON CONTRACTORS' CLAIMS (1972 May)

(a) If an appeal is filed by the Contractor from a final decision of the Contracting Officer under the DISPUTES clause of this contract, denying a claim arising under the contract, simple interest on the amount of the claim finally determined owed by the Government shall be payable to the Contractor. Such interest shall be at the rate established by the Secretary of the Treasury pursuant to Public Law 92-41; 85 STAT 97 for the Renegotiation Board from the date the Contractor furnishes to the Contracting Officer his written appeal pursuant to the DISPUTES clause of this contract, to the date of (i) a final judgement by a court of competent jurisdiction, or (ii) mailing to the Contractor of a supplemental agreement for execution either confirming completed negotiations between the parties or carrying out a decision of a Board of Contract Appeals.

(b) Notwithstanding (a) above, (i) interest shall be applied only from the date payment was due, if such date is later than the filing of appeal; and (ii) interest shall not be paid for any period of time that the Contracting Officer de-

termines the Contractor has unduly delayed in pursuing his remedies before a Board of Contract Appeals or a court of competent jurisdiction.

24. INCONSISTENCY BETWEEN ENGLISH VERSION AND TRANSLATION OF CONTRACT (1966 Apr)

In the event of inconsistency between any terms of this contract and any translation thereof into another language, the English language meaning shall control.

CLAUSES FOR USE ONLY IN SUPPLY CONTRACTS

25. CHANGES (1958 Jan)

The Contracting Officer may at any time, by a written order, and without notice to the sureties, make changes, within the general scope of this contract, in any one or more of the following: (i) Drawings, designs, or specifications, where the supplies to be furnished are to be specially manufactured for the Government in accordance therewith; (ii) method of shipment or packing; and (iii) place of delivery. If any such change causes an increase or decrease in the cost of, or the time required for the performance of any part of the work under this contract, whether changed or not changed by any such order, an equitable adjustment shall be made in the contract price or delivery schedule, or both, and the contract shall be modified in writing accordingly. Any claim by the Contractor for adjustment under this clause must be asserted within 30 days from the date of receipt by the Contractor of the notification of change, provided, however, that the Contracting Officer, if he decides that the facts justify such action, may receive and act upon any such claim asserted at any time prior to final payment under this contract. Where the cost of property made obsolete or excess as result of a change is included in the Contractor's

claim for adjustment, the Contracting Officer shall have the right to prescribe the manner of disposition of such property. Failure to agree to any adjustment shall be a dispute concerning a question of fact within the meaning of the clause of this contract entitled "Disputes". However, nothing in this clause shall excuse the Contractor from proceeding with the contract as changed.

26. VARIATION IN QUANTITY (1949 Jul)

No variation in the quantity of any item called for by this contract will be accepted unless such variation has been caused by conditions of loading, shipping, or packing, or allowances in manufacturing processes, and then only to the extent, if any, specified elsewhere in this contract.

27. INSPECTION (1958 May)

(a) All supplies (which term throughout this clause includes without limitation raw materials, components, intermediate assemblies, and end products) shall be subject to inspection and test by the Government, to the extent practicable at all times and places including the period of manufacture, and in any event prior to acceptance.

(b) In case any supplies or lots of supplies are defective in material or workmanship or otherwise not in conformity with the requirements of this contract, the Government shall have the right either to reject them (with or without instructions as to their disposition) or to require their correction. Supplies or lots of supplies which have been rejected or required to be corrected shall be removed or, if permitted or required by the Contracting Officer, corrected in place by and at the expense of the Contractor promptly after notice, and shall not thereafter be tendered for

acceptance unless the former rejection or requirement of correction is disclosed. If the Contractor fails promptly to remove such supplies or lots of supplies which are required to be removed or promptly to replace or correct such supplies or lots of supplies, the Government either (i) may by contract or otherwise replace or correct such supplies and charge to the Contractor the cost occasioned the Government thereby; or (ii) may terminate this contract for default as provided in the clause of this contract entitled "Default". Unless the Contractor corrects or replaces such supplies within the delivery schedule, the Contracting Officer may require the delivery of such supplies at a reduction in price which is equitable under the circumstances. Failure to agree to such reduction of price shall be a dispute concerning a question of fact within the meaning of the clause of this contract entitled "Disputes".

(c) If any inspection or test is made by the Government on the premises of the Contractor or a subcontractor, the Contractor without additional charge shall provide all reasonable facilities and assistance for the safety and convenience of the Government inspectors in the performance of their duties. If Government inspection or test is made at a point other than the premises of the Contractor or a subcontractor, it shall be at the expense of the Government except as otherwise provided in this contract; provided, that in case of rejection the Government shall not be liable for any reduction in value of samples used in connection with such inspection or test. All inspections and tests by the Government shall be performed in such a manner as not to unduly delay the work. The Government reserves the right to charge to the Contractor any additional cost of Government inspection

and test when supplies are not ready at the time such inspection and test is requested by the Contractor or when reinspection or retest is necessitated by prior rejection. Acceptance or rejection of the supplies shall be made as promptly as practicable after delivery, except as otherwise provided in this contract; but failure to inspect and accept or reject supplies shall neither relieve the Contractor from responsibility for such supplies as are not in accordance with the contract requirements nor impose liability on the Government therefor.

(d) The inspection and test by the Government of any supplies or lots thereof does not relieve the Contractor from any responsibility regarding defects or other failures to meet the contract requirements which may be discovered prior to acceptance. Except as otherwise provided in this contract, acceptance shall be conclusive except as regards latent defects, fraud, or such gross mistakes as amount to fraud.

(e) The Contractor shall provide and maintain an inspection system acceptable to the Government covering the supplies hereunder. Records of all inspection work by the Contractor shall be kept complete and available to the Government during the performance of this contract and for such longer period as may be specified elsewhere in this contract.

28. TITLE AND RISK OF LOSS (1968 Jun)

(a) Unless this contract specifically provides for earlier passage of title, title to supplies covered by this contract shall pass to the Government upon formal acceptance, regardless of when or where the Government takes physical possession.

(b) (1) Unless this contract specifically provides otherwise, risk of loss of or damage to supplies covered by this contract

shall remain with the Contractor until, and shall pass to the Government upon:

(i) delivery of the supplies to a carrier, if transportation is f.o.b. origin;

(ii) acceptance by the Government or delivery of possession of the supplies to the Government at the destination specified in this contract, whichever is later, if transportation is f.o.b. destination.

(2) Notwithstanding (1) above, the risk of loss of or damage to supplies which so fail to conform to the contract as to give a right of rejection shall remain with the Contractor until cure or acceptance, at which time (1) above shall apply.

(c) Notwithstanding (b) above, the Contractor shall not be liable for loss of or damage to supplies caused by the negligence of officers, agents, or employees of the Government acting within the scope of their employment.

29. DISCOUNTS (1968 Jun)

In connection with any discount offered, time will be computed from date of delivery of the supplies to carrier when acceptance is at the point of origin, or from date of delivery at destination or port of embarkation when delivery and acceptance are at either of these points, or from the date the correct invoice or voucher is received in the office specified by the Government, if the latter is later than date of delivery. Payment is deemed to be made for the purpose of earning the discount on the date of mailing of the Government check.

30. RESPONSIBILITY FOR INSPECTION (1968 Sep)

Notwithstanding the requirements for any Government inspection and test contained in speci-

fications applicable to this contract, except where specialized inspections or tests are specified for performance solely by the Government, the Contractor shall perform or have performed the inspections and tests required to substantiate that the supplies and services provided under the contract conform to the drawings, specifications and contract requirements listed herein, including if applicable the technical requirements for the manufacturers' part number specified herein.

CLAUSES FOR USE ONLY IN NON-PERSONAL SERVICE CONTRACTS

31. CHANGES (1971 Nov)

The Contracting Officer may at any time, by a written order, and without notice to the sureties, make changes, within the general scope of this contract, in the definition of services to be performed, and the time (i.e., hours of the day, days of the week, etc.) and place of performance thereof. If any such change causes an increase or decrease in the cost of, or the time required for the performance of any part of the work under this contract, whether changed or not changed by any such order, an equitable adjustment shall be made in the contract price or delivery schedule, or both, and the contract shall be modified in writing accordingly. Any claim by the Contractor for adjustment under this clause must be asserted within 30 days from the date of receipt by the Contractor of the notification of change, provided, however, that the Contracting Officer, if he decides that the facts justify such action, may receive and act upon any such claim asserted at any time prior to final payment under this contract. Where the cost of property made obsolete or excess as result of a change is included in the Contractor's claim for adjustment, the Con-

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tracting Officer shall have the right to prescribe the manner of disposition of such property. Failure to agree to any adjustment shall be a dispute concerning a question of fact within the meaning of the clause of this contract entitled, "Disputes". However, nothing in this clause shall excuse the Contractor from proceeding with the contract as changed.

32. INSPECTION OF SERVICES
(1971 Nov)

(a) All services (which term throughout this clause includes services performed, material furnished or utilized in the performance of services, and workmanship in the performance of services) shall be subject to inspection and test by the Government, to the extent practicable at all times and places during the term of contract. All inspections by the Government shall be made in such a manner as not to unduly delay the work.

(b) If any services performed hereunder are not in conformity with the requirements of this contract, the Government shall have the right to require the Contractor to perform the services again in conformity with the requirements of the contract, at no additional increase in total contract amount. When the services to be performed are of such a nature that the defect cannot be corrected by reperformance of the services, the Government shall have the right to (i) require the Contractor to immediately take all necessary steps to ensure future performance of the services in conformity with the requirements of the contract; and (ii) reduce the contract price to reflect the reduced value of the services performed. In the event the Contractor fails promptly to perform the services again or to take necessary steps to insure future performance of the services in conformity with the requirements of the contract, the Government shall have the right to either (i) by contract or otherwise have the services performed in conformity with the contract requirements and charge to the Contractor any cost occasioned to the Government that is directly related to the performance of such

services; or (ii) terminate this contract for default as provided in the clause of this contract entitled "Default".

(c) The Contractor shall provide and maintain an inspection system acceptable to the Government covering the services to be performed hereunder. Records of all inspection work by the Contractor shall be kept complete and available to the Government during the term of this contract and for such longer period as may be specified elsewhere in this contract.

33. DISCOUNTS (1971 Nov)

In connection with any discount offered, time will be computed from the date of completion of performance of the services or from the date correct invoice or voucher is received in the office specified by the Government, if the latter is later than date of completion of performance. Payment is deemed to be made for the purpose of earning the discount on the date of mailing of the Government check.

34. DISPUTES (1960 May) - USAF ASPR Supplement 7-103.12(c)

(a) Except as otherwise provided in this contract, any dispute concerning a question of fact arising under this contract which is not disposed of by agreement shall be decided by the Contracting Officer, who shall reduce his decision to writing and mail or otherwise furnish a copy thereof to the Contractor. The decision of the Contracting Officer shall be final and conclusive unless, within 30 days from the date of receipt of such copy, the Contractor mails or otherwise furnishes the Contracting Officer a written appeal addressed to the person indicated in either (b) or (c) below.

(b) When the total amount claimed by the Contractor, or asserted as due the Government is \$50,000 or less, the written appeal shall be addressed to the Commander in Chief, USAF, and the decision of the said Commander in Chief, or that of his duly authorized representative (other than the Contracting Officer named in this contract) for the determination of such appeals, shall be final and conclusive to the extent permitted by United States law.

(c) When the total amount claimed by the Contractor, or asserted as due the Government is more than \$50,000 the written appeal shall be addressed to the Secretary of the Air Force, and the decision of the Secretary, or that of his duly authorized representative for the determination of such appeals, shall be final and conclusive to the extent permitted by United States law.

(d) In connection with any appeal proceeding under this clause, the Contractor shall be afforded an opportunity to be heard and to offer evidence in support of its appeal. Pending final decision of a dispute hereunder, the Contractor shall proceed diligently with the performance of the contract and in accordance with the Contracting Officer's decision.

(e) This "Disputes" clause does not preclude the consideration of law questions in connection with decisions provided for in paragraphs (a), (b) and (c) above, provided that nothing in this contract shall be construed as making final the decision of any administrative official, representative, or board on a question of law.

35. NOTICE TO THE UNITED STATES GOVERNMENT OF LABOR DISPUTES (1958 Sep) - ASPR 7-104.4

(a) Whenever the Contractor has knowledge that any actual or potential labor dispute is delaying or threatens to delay the timely performance of this contract, the Contractor shall immediately give notice thereof, including all relevant information with respect thereto, to the Contracting Officer.

(b) The Contractor agrees to insert the substance of this clause, including this paragraph (b), in any subcontract hereunder as to which a labor dispute may delay the timely performance of this contract, except that each such subcontract shall provide that in the event its timely performance is delayed or threatened by delay by any actual or potential labor dispute, the subcontractor shall immediately notify his next higher tier subcontractor, or the prime contractor, as the case may be, of all relevant information with respect to such dispute.

36. SAFETY AND ACCIDENT PREVENTION (1977 Mar) - Air Force ASPR Supplement 7-5000.10

In performing work under this contract on a Government installation, the contractor shall (i) conform to the specific safety requirements contained in the contract and (ii) for those related activities not directly addressed by this contract, conform to the applicable safety rules prescribed in AFR 127-101, and Air Force Occupational Safety and Health (AFOSH) Standards, developed in accordance with AFR 127-12 and AFR 8-14, for Air Force bases or prescribed by the Government installation if other than an Air Force base, and (iii) take such additional immediate precautions as the contracting officer may reasonably require for safety and accident prevention purposes. The contractor agrees to take all reasonable steps and precautions to prevent accidents and preserve the life and health of contractor and Government personnel performing or in any way coming in contact with the performance of this contract on such premises. Any violation of such rules and requirements, unless promptly corrected as prescribed by the contracting officer, shall be grounds for termination of this contract in accordance with the default provisions hereof.

37. LAW GOVERNING CONTRACTS (1970 Jul) - USAF ASPR Supplement 7-2000.1

In any dispute arising out of this contract, the decision of which requires consideration of law questions, the rights and obligations of the parties shall be interpreted and determined in accordance with the substantive laws of the United States of America.

The following Clause 38 is applicable to contracts which involve the performance of services on a Government installation:

38. PROTECTION OF GOVERNMENT BUILDINGS, EQUIPMENT AND VEGETATION (1968 FEB) -
ASPR 7-104.63

The Contractor shall use reasonable care to avoid damaging existing buildings, equipment, and vegetation (such as trees, shrubs, and grass) on the Government installation. If the Contractor fails to do so and damages any such buildings, equipment, or vegetation, he shall replace or repair the damage at no expense to the Government as directed by the Contracting Officer. If he fails or refuses to make such repair or replacement, the Contractor shall be liable for the cost thereof which may be deducted from the contract price.

39. PAYMENT OF INTEREST ON CONTRACTORS' CLAIMS (1976 JUL) ASPR 7-104.82

(a) If an appeal is filed by the Contractor from a final decision of the Contracting Officer under the DISPUTES clause of this contract, denying a claim arising under the contract, simple interest on the amount of the claim finally determined owed by the Government shall be payable to the Contractor. Such interest shall be at the rate established by the Secretary of the Treasury pursuant to Public Law 92-41, 85 STAT 97, from the date the Contractor furnishes to the Contracting Officer his written appeal under the DISPUTES clause of this contract, to the date of (i) a final judgment by a court of competent jurisdiction, or (ii) mailing to the Contractor of a supplemental agreement for execution either confirming completed negotiations between the parties or carrying out a decision of a board of contract appeals.

(b) Notwithstanding (a) above, (i) interest shall be applied only from the date payment was due, if such date is later than the filing of appeal; and (ii) interest shall not be paid for any period of time that the Contracting Officer determines the Contractor has unduly delayed in pursuing his remedies before a board of contract appeals or a court of competent jurisdiction.

40. ALTERATIONS IN CONTRACT (1949 JUL) ASPR 7-105.1

The following alterations have been made in the provisions of this contract:

- a. Clause 23, "PAYMENT OF INTEREST ON CONTRACTORS' CLAIMS", of USEUCOM Form 15, is deleted in its entirety.

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41. GOVERNMENT DELAY OF WORK (1968 SEP) ASPR 7-104.77 (f)

(a) If the performance of all or any part of the work is delayed or interrupted by an act of the Contracting Officer in the administration of this contract, which act is not expressly or impliedly authorized by this contract, or by his failure to act within the time specified in this contract (or within a reasonable time if no time is specified), an adjustment (excluding profit) shall be made for any increase in the cost of performance of this contract caused by such delay or interruption and the contract modified in writing accordingly. Adjustment shall be made also in the delivery or performance dates and any other contractual provision affected by such delay or interruption. However, no adjustment shall be made under this clause for any delay or interruption (i) to the extent that performance would have been delayed or interrupted by any other cause, including the fault or negligence of the Contractor; or (ii) for which an adjustment is provided or excluded under any other provision of this contract.

(b) No claim under this clause shall be allowed (i) for any costs incurred more than twenty (20) days before the Contractor shall have notified the Contracting Officer in writing of the act or failure to act involved; and (ii) unless the claim, in an amount stated, is asserted in writing as soon as practicable after the termination of such delay or interruption, but not later than the date of final payment under the contract.

42. BASE PASSES - USAFE ASPR SUP 7-1960 (1975 AUG)

Prior to commencing work the contractor shall submit a request for base passes to the Contracting/Ordering Officer. Such passes shall be returned immediately to the issuing officer when:

- a. Pass has expired;
- b. Pass holder is no longer employed by the Contractor;
- c. Contract is completed.
- d. Contracting Officer so directs.

43. REMOVAL OF CONTRACTOR'S EMPLOYEES (1965 OCT) ASPR 7-1002.6

The Contractor agrees to utilize only experienced, responsible and capable people in the performance of the work. The Contracting Officer may require that the Contractor remove from the Government job employees who endanger persons or property, or whose continued employment under this contract is inconsistent with the interests of military security.

44. LIMITATION OF PRICE AND CONTRACTOR OBLIGATIONS (1966 OCT) ASPR 7-104.47

(a) This clause applies only in the event this contract is awarded on the alternative basis for award described in the Schedule as "Multi-Year Procurement."

(b) Funds are available for performance of this contract in the amount specifically described in the Schedule, as available for contract performance. The amount of funds so described at the time of award is not considered sufficient for the contract performance required by and described in the Schedule for any Program Year other than the First Program Year. Upon availability to the Contracting Officer of additional funds sufficient for performance of the full requirements for the next succeeding Program Year, the Contracting Officer shall, not later than the date specified in the Schedule, unless a later date is agreed to by the parties, so notify the Contractor in writing and the amount of funds described in the Schedule as available for contract performance shall be modified accordingly. This procedure shall apply for each successive Program Year.

(c) The Government is not obligated to the Contractor for contract performance in any monetary amount in excess of that described in the Schedule or modifications thereto, as available for contract performance.

(d) The Contractor is not obligated to incur costs for the performance required for any Program Year after the first unless and until he has been notified in writing by the Contracting Officer of an increase in availability of funds, in accordance with paragraph (b) of this clause. If so notified, the Contractor's obligation shall be increased only to the extent contract performance is required for the additional Program Year for which funds have been made available.

(e) In the event of termination pursuant to the "Termination for Convenience of the Government" clause of this contract, the term "total contract price" as used in that clause refers to the amount available for performance of this contract, as provided for in this clause, plus the applicable amount established as the cancellation ceiling, and the term "work under the contract" as used in that clause refers to the work under Program Year requirements for which funds have been made available. In the event of termination for default, the Government's rights under this contract shall apply to the entire multi-year requirements.

(f) Notification to the Contractor of an increase or decrease in the funds available for performance of this contract as a result of a clause other than this clause (e.g., exercise of an option for increased quantities or the "Changes" clause) shall not constitute the notification contemplated by paragraph (b) of this clause.

45. CANCELLATION OF ITEMS - SERVICE CONTRACTS (1974 APR) ASFR 7-1903.33

(a) This clause applies only in the event this contract is awarded on the alternative basis for award described in the Schedule as "Multi-Year Procurement."

(b) As used herein, the term "cancellation" means that the Government is canceling, pursuant to this clause, its Program Year requirements for items as set forth in the Schedule for all Program Years subsequent to that in which notice of cancellation is provided. Such cancellation shall occur only if, by the date or within the time period specified in the Schedule, or such further time as may be agreed to, the Contracting Officer (i) notifies the Contractor that funds will not be available for contract performance for any subsequent Program Year, or (ii) fails to notify the Contractor that funds have been made available for performance of the Program Year requirement for the succeeding Program Year.

(c) Except for cancellation pursuant to this clause or for termination pursuant to the "Default" clause, any reduction by the Contracting Officer in the quantities called for under this contract shall be considered a termination in accordance with the "Termination for Convenience of the Government" clause of this contract.

(d) In the event of cancellation pursuant to this clause, the Contractor will be paid, as consideration therefor, a cancellation charge not to exceed the cancellation ceiling described and separately set forth in the Schedule as being applicable at the time of cancellation.

(e) The cancellation charge is intended to cover only expenses incurred by the Prime Contractor or his subcontractor which would have been equitably amortized in the unit prices for the entire multi-year contract period, but which because of the cancellation are not so amortized. The cancellation charge shall be computed and the claim therefor made as would be applicable under the "Termination for Convenience of the Government" clause of this contract. The Contractor shall submit the claim promptly but in no event later than one year (i) from the date of notification of the nonavailability of funds, if issued pursuant to paragraph (b) (i), or (ii) from the date specified in the schedule by which notification of the availability of additional funds for the next succeeding program year is required to be issued, whichever is earlier, unless one or more extensions in writing are granted by the Contracting Officer, upon request of the Contractor made in writing within such one year period or authorized extension thereof. The claim may include reasonable start-up and other nonrecurring costs such as plant or equipment relocation costs, the costs of special tooling and special equipment; allocable portions of the costs of facilities acquired or established for the conduct of the work, PROVIDED such costs have not been charged to the contract through overhead, or otherwise depreciated, and to the extent that it is impracticable for the Contractor to utilize such facilities in the conduct of his

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commercial work; costs incurred for the assembly training and transportation of a specialized work force to and from the job site; and costs not amortized by the level contract unit price solely because the cancellation had precluded anticipated benefits of Contractor or subcontractor learning. The claim shall not include any amount for:

- (i) labor, material, or other expenses incurred by the Contractor or its subcontractor for performance of the canceled work;
- (ii) any item of cost for which payment has already been made to the Contractor;
- (iii) anticipated profit on the canceled work;
- (iv) the remaining useful commercial life of facilities. Useful commercial life, for this purpose, means the commercial utility of the facilities rather than the physical life thereof, with due consideration given to such factors as location of facilities, specialized nature thereof, and obsolescence.

(f) If this contract includes an option to increase quantities in which the period for exercise of the option is limited to the date set forth in the contract for notifying the Contractor that funds are available for the requirement of the next succeeding program year, the Contractor agrees not to include in the price for option quantities any costs of a startup or nonrecurring nature, which costs have been fully provided for in the unit prices of the firm quantities of the Program Years, and further agrees that the prices offered for option quantities will reflect only those recurring costs, and a reasonable profit thereon, which are necessary to furnish the additional option quantities. Therefore, any quantities added to the original contract quantities through exercise of the Government option in the "Option to Increase Quantities" clause of this contract shall not be subtracted from what would otherwise be considered the quantity canceled for the purpose of computing allowable cancellation charges.

46. APPROVAL OF CONTRACT (1949 JUL) ASPR 7-105.2

This contract shall be subject to the written approval of the Secretary or his duly authorized representative and shall not be binding until approved.

CLAUSES INCORPORATED BY REFERENCE

The provisions of the following contract clauses of the Armed Services Procurement Regulations (ASPR) are incorporated into this contract by reference with the same force and effect as though fully set forth herein. The complete text of any clause incorporated in this contract by reference may be obtained from the Contracting Officer.

<u>CLAUSE NO.</u>	<u>ASPR PARAGRAPH</u>	<u>CLAUSE TITLE</u>	<u>DATE OF CLAUSE</u>
47	7-104.24(f)	GOVERNMENT FURNISHED PROPERTY (SHORT FORM)	64 NOV
48	7-104.29(b)	PRICE REDUCTION FOR DEFECTIVE COST OR PRICING DATA	70 JAN
49	7-104.42(b)	SUBCONTRACTOR COST OR PRICING DATA	70 JAN
50	7-603.49	AIRFIELD SAFETY PRECAUTIONS	68 APR
51	7-104.44(a)	VALUE ENGINEERING INCENTIVE	77 JAN

APPENDIX B
Sample Bird Hazard Reduction Plan

HEADQUARTERS
56TH TACTICAL FIGHTER WING
MACDILL AFB, FLORIDA



56 TFW PLAN 127-15
BIRD AIRCRAFT STRIKE HAZARD
30 JULY 1978

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 56TH TACTICAL FIGHTER WING (TAC)
MACDILL AIR FORCE BASE FLORIDA 33604

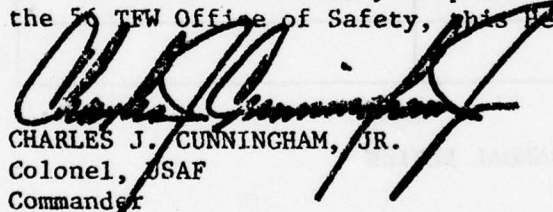


REPLY TO
ATTN: SE

SUBJECT: 56 TFW Plan 127-15 Bird Aircraft Strike Hazard

10 See Distribution (ANNEX 2)

1. Forwarded herewith is the 56 TFW Plan 127-15 which provides guidance for reducing the bird strike hazard in the areas where the 56 TFW conducts flying operations.
2. This plan is effective for planning on receipt and for execution when directed by this Headquarters.
3. This plan was coordinated with all tasked organizations.
4. Tasked organizations will develop necessary checklists for implementation. Supporting plans are not required.
5. This plan will be reviewed as of 30 July each year and updated as appropriate. Tasked organizations will review this plan 30 days prior to that date and forward comments to 56 TFW/SEF by 30 July.
6. The Office of Primary Responsibility (OPR) for this plan is the 56 TFW Office of Safety, this Headquarters.


CHARLES J. CUNNINGHAM, JR.
Colonel, USAF
Commander

Readiness is our Profession

HEADQUARTERS 56TH TACTICAL FIGHTER WING
MACDILL AFB, FLORIDA 33608
30 JULY 1978

56 TFW PLAN 127-15

SECURITY INSTRUCTIONS/RECORD OF CHANGES/ANNUAL REVIEW

1. The long title of this plan is 56 Tactical Fighter Wing Bird Aircraft Strike Hazard Plan 127-15. The short title is 56 TFW BASH Plan.
2. The overall classification of this document is UNCLASSIFIED.
3. Reproduction of this document in whole or in part is prohibited except as required for preparation of supporting directives, operating instructions or checklists.

RECORD OF CHANGES

CHANGE NUMBER	DATE	DATE POSTED	POSTED BY

RECORD OF ANNUAL REVIEW

REVIEWED BY	DATE REVIEWED	REMARKS

OPR: 56TFW/SE

56 TFW PLAN 127-15
PLAN SUMMARY

1. PURPOSE: To provide a base program designed to minimize aircraft exposure to potentially hazardous bird strikes where the 56 TFW conducts flying operations.
2. CONDITIONS FOR EXECUTION: This plan is based on hazards from both indigenous bird populations and seasonal bird migration. Implementation of specific portions of the Plan are continuous, while other portions require implementation as dictated by bird activity.
3. OPERATIONS TO BE CONDUCTED:
 - a. Specific Operations Include:
 - (1) The establishment of a Bird Hazard Working Group.
 - (2) Procedures for reporting hazardous bird activity and altering/discontinuing flying operations.
 - (3) Provisions to provide information to all assigned aircrews and transient aircrews on specific bird hazards and procedures for avoidance.
 - (4) Actions to eliminate/reduce environmental factors which attract birds to the airfield.
 - b. Organizations Tasked: As listed in ANNEX A
 - c. Supporting Plans not required.

56 TFW PLAN 127-15
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OPR: 56 TFW/SE

iv

56 TFW PLAN 127-15 - BIRD AIRCRAFT STRIKE HAZARD
BASIC PLAN

REFERENCES: AFR 127-15
BASH Survey
Other (Reports, letters and supportive material provided
by competent biologists or wildlife managers)

TASK ORGANIZATION: ANNEX A

1. SITUATION:

a. GENERAL. This Plan establishes an overall bird control program for MacDill Air Force Base and is designed to minimize aircraft exposure to potentially hazardous bird strikes or strikes with terrestrial animals. The hazards to safe flying operations posed by birds are so varied that no single solution to the bird strike problem exists. This Plan is designed to:

- (1) Establish a Bird Aircraft Hazard Working Group.
- (2) Establish procedures to identify and to communicate high hazard situations to aircrews and supervisors to determine if altering/discontinuing flying operations is required.
- (3) Determine aircraft and airfield operating procedures to avoid high hazard situations.
- (4) Provide for dissemination of information to all assigned aircrews and transient aircrews on specific bird hazards and procedures for avoidance.
- (5) Decrease the attractiveness of the airfield to birds by eliminating, controlling or reducing environmental factors which support the birds.

b. AIRFIELD/LOCAL AREA. MacDill AFB occupies 5620 acres in Hillsborough County, Florida, and is located on a natural peninsula between old and new Tampa Bays. The mean elevation of the base is 13 feet above Mean Sea Level (MSL). MacDill AFB is drained into several natural creeks, drainage ditches and by tidal action. There are approximately 890 acres of undeveloped land on MacDill AFB most of which is on the south side of the base complex. The underdeveloped land mainly consists of Red, Black, and White Mangrove with a small proportion being planted Pine with varied understory, mature Pine with mixed understory of Pine, Grass, Pine Brush, Scrub Oak and Palmetto.

The southwestern portion of the base is being invaded by Florida Pepper and mixed brush. The area adjacent to the runway consists of a mix of Florida grasses where closely maintained. The infield area which is only periodically maintained is being invaded by Dog Fennel, Ragweed, Sesbania and some brush, consisting of Wax Myrtle, Florida Pepper, Willow and Scrub Oak. In addition, there is a 13 acre borrow pit which has been turned into a pond located just north of the field boundary adjacent to the runway and a sanitary landfill 8500 feet southeast of the runway. The Mangroves, wooded areas, pond and grasslands surrounding the airfield and the landfill provide a large variety of habitats capable of supporting birds hazardous to aircraft. In particular, the pond is attracting waterfowl; the landfill, seagulls, and the invasion by uplands vegetation is attracting upland species which have become permanent residents of the area. More specific hazards are listed in ANNEX C.

c. ENROUTE/LOW LEVEL FLYING AREAS. Aircraft flying out of MacDill generally use southern Florida as the primary enroute and low level flying area. This area has many features which attract a variety of birds from migratory waterfowl through upland species, to shore birds. The two most hazardous species being the raptors (vultures) and the migratory waterfowl. Specific enroute hazards are outlined in ANNEX C.

d. AVON PARK GUNNERY RANGE. Avon Park occupies 107,000 acres of land in Polk and Highlands counties in central Florida and most of the area is typically Southern Florida flatwoods comprised of nearly level sandy flatlands interspersed with small swamps and wet grasslands. Other parts of the area are fragmental remains of a relatively high sand ridge consisting of droughty sands interspersed with small, poorly drained areas and few ponds. The flatwoods represent approximately 57,000 acres of the area. Of this, 27,000 acres have been reforested with slash pine, starting in 1965. Plantations were established in various sized blocks and are distributed throughout the type. Approximately 4,000 acres of this type are stocked with natural stands of slash pine of 30-50 years of age. The remaining area is essentially unstocked, with saw palmetto, gallberry, and native grasses comprising the majority of the cover. Approximately 20,000 acres of small swamps and wet grasslands are interspersed throughout the flatwoods type. These areas vary considerably in size and vegetation, from open ponds with marsh grasses; dense hardwood swamps with various species of gums, bays, ash and maple; pond and bald cypress stands of varying ages; and two extensive marshes, one of approximately 3200 acres located along the southwest boundry of the installation, the other approximately 2800 acres located along the southeast boundry. The sand ridge area comprises 9400 acres, oriented north-south in the center of the installation. This type is made up of sand pine of 10-40 years of age in dense stands, open scrub oak associations with scattered long leaf pine, and long leaf pine stands, 40-60 years old. The terrain in and around Avon Park provides an abundant variety of habitats for birds that are hazardous to aircraft. Specifics are outlined in ANNEX C.

3. EXECUTION:

a. CONCEPT OF OPERATIONS:

(1) Overall OPR and monitor for the implementation of this Plan is the 56 TFW Office of Safety.

(2) Bird Aircraft Hazard Working Group.

(a) Function. Review data on bird strikes, identify and initiate actions to reduce hazards, review and implement changes in operational procedures, prepare informational programs for aircrews.

(b) Authority. The BASH Working Group submits all efforts to the operational commander for approval. Implementation is through normal chain of command.

(c) Composition. The chairman, as appointed by the Commander, will be the 56TFW Vice Commander. As a minimum, the group will consist of a representative from Current Operations, Standardization/Evaluation, Flight Safety, Airfield Management, Civil Engineering, the flying organizations and representatives from other Task Organizations (ANNEX A) as required.

(d) Meeting Schedule. Quarterly.

(3) Operating Procedures. (As defined by the BASH Working Group and approved by the Commander of Higher Headquarters as appropriate).

b. TASKS: ANNEX B outlines the general and continuing tasks and responsibilities for each organization. ANNEX C lists specific tasks to counter hazards that are discovered and will remain in effect only until the hazard is removed or reduced sufficiently as determined by the seasonal nature of the hazard or by the BASH Working Group.

ANNEXES:

A - Task Organization

B - Tasks and Responsibilities

C - Operations

Q - Maps and Charts

R - Reports and Forms

S - Bird Hazard Warning System, Operation Birdwatch

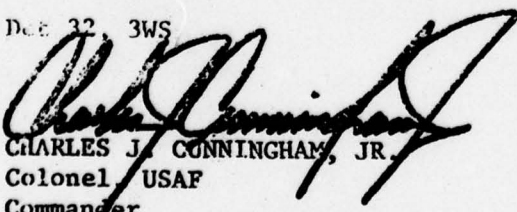
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CHARLES J. CUNNINGHAM, JR.,
Colonel, USAF
Commander

HEADQUARTERS 56TH TACTICAL FIGHTER WING
MACDILL AFB, FLORIDA 33608
30 JULY 1978

ANNEX A TO 56 TFW PLAN 127-15
TASK ORGANIZATION

<u>ORGANIZATION</u>	<u>COMMANDER</u>
56 TFW	Commander
56TFW/DO	Deputy Commander
56 TFW/MA	Deputy Commander
56TFW/SE	Chief
56TFW/OI	Chief
USAF Regional Hospital	Commander
56CSG/DE	Chief
56CSG/SV	Chief
56CSG/DC	Chief
56CSG/OTM	Chief
56CSG/SS	Chief
56CSG/SP	Chief
1928CG/FFA	Chief
13TFTS	Commander
61TFS	Commander
62TFS	Commander
63TFS	Commander
56CSS/OT	Operations Officer
Doc 32, 3WS	Commander


CHARLES J. CUNNINGHAM, JR.
Colonel, USAF
Commander

OIR: 56TFW/SE

ANNEX B TO 56TFW PLAN 127-15
TASKS AND RESPONSIBILITIES

1. Safety:

- a. Include BASH group recommendations and actions in the agenda and minutes of the Wing Aerospace Safety Council.
- b. Establish procedures for reporting and recording all birdstrikes at MacDill or involving 56TFW aircraft.
- c. Monitor activities of all tasked agencies for compliance with this directive.
- d. Disseminate trend data to BASH group and flying units.
- e. Coordinate with Safety Offices at Homestead and Patrick AFB concerning their BASH activities in the local flying area and at Avon Park. (Crosstell)
- f. Provide the BASH Working Group with the current BASH reduction data received from Higher Headquarters, the U.S. Fish and Wildlife Service and other agencies.
- g. Provide a capability for and maintain a current bird situation/activity chart for use by all flying units. This will include:
 - (1) BASH activity plotting/recording for low level and Avon Park operations.
 - (2) MacDill activity, sightings and strikes.
- h. Provide in addition to the above, as much information concerning bird migratory activities as can be obtained through contact with the U.S. Fish and Wildlife Service and local bird study groups.
- i. Provide a capability for declaring, disseminating, and terminating BIRDWATCH Conditions on the Low Level routes and at Avon Park.
- j. Coordinate and establish procedures with the Security Police to provide an individual to use pyrotechnic devices for bird dispersal as required when Security Police personnel are not available.

2. HOSPITAL:

- a. The MacDill Regional Hospital will provide assistance, advise

and support to the MacDill BASH Program as required and within capabilities to include:

(1) Provide storage space within mortuary area for the storage of perishable bird remains.

(2) Assistance in packaging remains in dry ice for shipment to the bird and mammal laboratories.

3. MORALE, WELFARE AND RECREATION:

a. The 56CSG Chief of Morale, Welfare and Recreation will establish a program to minimize the attractiveness of assigned facilities to bird activity.

4. OFFICE OF INFORMATION:

a. The 56TFW Office of Information will participate as required and upon request will provide a public information program designed to inform base personnel, dependents and the general public on the hazards of uncontrolled bird activity and the measures being taken to minimize them.

5. BASE AUDIOVISUAL SERVICES:

a. Provide photographic services as required to document bird strikes and related activities as required.

b. Provide graphics as required to publicize the hazards and actions required to minimize them.

6. BASE CIVIL ENGINEER:

a. Provide an environmental officer to the BASH Working Group to monitor and advise the group on Environmental Modification. The Base Civil Engineer is responsible for developing procedures for removal or control of as many bird attractants as possible and initiating the necessary surveys and writing of environmental impact assessments and statements on procedures undertaken as required by law.

b. In addition to providing those services as required to eliminate specific habitats to counter identified hazards, the Civil Engineer should develop a long range program, in conjunction with all base improvements and modifications, in an attempt to make the airfield as unattractive to birds as feasible. This project/program should be termed operation "Bird Bare."

c. To assist in these programs the following general Civil Engineering considerations are provided:

(1) Control vegetation

- (a) Mowing Operations - (Time - height)
- (b) Ditches (cut) 50 to 1 slope (See (2)(a))
- (c) Filling low spots (See (2)(a))
- (d) Planting bare areas
- (e) Removing dead vegetation/rubble (Perches)
- (f) Remove high spots (Perches)
- (g) Remove edge effect
- (h) Remove plants with berries

(2) Control water

- (a) Modify ditches - slope and clear (See (1)(b))
- (b) Consider covering/culverts
- (c) Eliminate standing water (See (1)(c))
- (d) Patrol/clear beaches and rip edge of feeding materials
- (e) Drain marsh areas

(3) Control waste

- (a) Collect appropriately
- (b) Dispose of rapidly

(4) Control birds (Chemical/Physical Alterations)

- (a) Check/bird proof buildings - hangers
- (b) Check other perches towers, etc.
- (c) Use avitrol as required
- (d) Use naphthlene around perches (Alt)
- (e) Sticky material around perches (Alt)
- (f) Electrical charge around perches (Alt)

- (g) Strobes in buildings
- (h) Queletox (Kill)
- (i) Control insects

7. FLYING ORGANIZATIONS:

- a. Will insure aircrews participate in the BASH reduction program by promptly reporting all bird strikes and hazardous conditions IAW this directive.
- b. Will coordinate unit flying activities, through scheduling, to minimize exposure to migratory birds based on data obtained from SEF/BASH.
- c. Unit FSOs will periodically visit SEF, obtain the current bird activity data and post the information so that it is readily available for briefing aircrews. Frequency of visits will be determined by phase of training unit is currently undergoing.
- d. Unit FSOs will insure that the current bird activity data is available and briefed in conjunction with the prephase briefing for both the ground attack and low level phases.
- e. Unit FSOs will insure an adequate supply of bird strike/activity report forms are readily available for the aircrews.

8. STANDARDIZATION/EVALUATION:

- a. Review with 56TFW/DOO all proposed new low level routes or changes to existing low level routes for BASH impact.
- b. Monitor, on a regular basis, aircrew preflight briefings to insure BASH is covered during the briefing.

9. AVON PARK OPERATIONS:

- a. Establish procedures to report significant bird activity noted on the gunnery ranges to SEF and advise aircrews under their control of same.
- b. Establish procedures to notify SEF of any bird activity or strikes reported to Avon Control by aircrews.

10. FLIGHT FACILITIES:

- a. Establish procedures to observe bird activity on and above the airfield visually and by radar, and report such to Wing Safety during normal 56TFW flight operations and to Airfield Management at other times.

b. Issue Birdwatch advisories to aircraft as required.

c. Provide Airfield Management immediate access to the runway under Birdwatch Condition Red if required.

d. Insure airfield lighting remains off except as required for aircraft operations.

11. AIRFIELD MANAGEMENT:

a. IAW ANNEX S of this Plan, during normal 56 TFW flight operations the authority to declare a Birdwatch condition is solely vested with the 56 TFW Safety Office. The MacDill AFB Chief of Airfield Management or his designated representative, is the declaring authority during all other periods.

(1) Declaration of a Birdwatch condition by the Chief of Airfield Management should be based upon the following:

(a) Information relayed by airborne aircraft.

(b) Observations made by and relayed to Base Operations by MacDill AFB Tower and Transient Alert personnel.

(c) Observations made by Base Operations personnel.

(2) Once a Birdwatch condition has been declared by Base Operations personnel, it is their sole responsibility to either cancel or downgrade the condition, commensurate with updated information.

b. The Chief of Airfield Management or his designated representatives, will be a prime source for observing conditions that could create a bird strike hazard and will react to disperse flocks of birds using available bioacoustic equipment when required.

(1) Primary Means (Prevention). Environmental conditions observed in the runway vicinity that could attract birds will be reported to the Environmental Section, 56CSG/DE, (ex., standing water areas/areas of recently mowed grass/confirmed and suspected roosting areas.)

(2) Secondary Means (Dispersal). The Chief of Airfield Management will:

(a) Insure the Base Operations emergency response vehicle is equipped and operationally maintained with bioacoustical equipment.

(b) Insure assigned personnel are properly trained to utilize the equipment.

ANNEX C TO 56 TFW PLAN 127-15
OPERATIONS

REFERENCES: (Bird/Aircraft Strike Hazard Team Reports, Reports from other wildlife agencies, etc.)

1. **GENERAL:**

a. **PURPOSE.** This ANNEX provides information on the different types of bird strike hazards and recommendations on countering each hazard.

b. **MISSION.** See Basic Plan.

2. **CONCEPT OF OPERATIONS.** The following is a summary, in order of seriousness, of the bird strike hazards and recommendations for reducing each hazard to flight operations. A brief description of each bird and how each method of control or avoidance is to be employed is provided. Each control measure will have a corresponding tasked organization in the Basic Plan.

3. **SPECIFIC HAZARDS:**

a. **MACDILL AFB AREA:**

(1) Brown Pelican (*Pelecanus Occidentalis*).

(a) Hazard: This protected species can be seen frequently on the catwalks of the approach lighting for runway 04. It also flies in small flocks (3-6 birds) in varied formations. Pelicans feed primarily on small fish and dive from altitudes of 30 feet or less. The primary threat occurs when the small flocks transit the runway approaches and departures in search of food.

(b) Hazard Reduction: Habitat modification is not feasible nor desirable for this species. The primary counter to this hazard is increased awareness by aircrews and runway supervisory personnel. The approaches should be closely monitored for their activity and appropriate advisories should be transmitted as required. OPR: 56TFW/DO/OTM.

(2) Seagulls (*Charadriiformes, Laridae*).

(a) Hazard: This species provides the largest threat to flight operations in the airfield area. Several subfamilies are permanent residents of the bay area as well as a migratory hazard. Seagulls are primarily scavengers and gather at garbage dumps, docks and other lucrative sources of food. Their travels from roost to food source to loafing areas constitute the greatest hazards.

OPR: 56TFW/SE

(b) Hazard Reduction: Habitat modification and control techniques must be devised to effectively reduce the threat.

1. The source of easy food within the general airfield area must be reduced to an absolute minimum. The sanitary landfill operation must be closely monitored as it is the major attractant and food source. OPR: 56CSG/DE

2. Once the food source is eliminated, action should be taken to reduce the attraction of the loafing areas such as clear ramp space and closely mowed fields through the use of harassment and dispersal procedures such as:

- a. Pyrotechnics
- b. Bioacoustics
- c. Chemicals
- d. Mowing operations

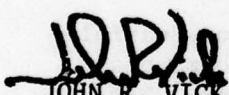
OPR: 56CSG/OTM/DE

3. Sources of fresh drinking water near loafing areas must also be eliminated. OPR: 56CSG/DE

(Other resident species in the immediate area which need to be studied include:

Raptors; owls, nighthawks, doves, cattle; egrets, common crows, shorebirds, plovers, pipers, upland species; blackbirds, starlings.

In addition to the migratory species: Waterfowl, Ibus, Cranes.)


JOHN R. VICK, Major, USAF
Chief, Safety Division

HEADQUARTERS 56TH TACTICAL FIGHTER WING
MACDILL AFB, FLORIDA 33608
30 JULY 1978

ANNEX Q TO 56 TFW PLAN 127-15
MAPS AND CHARTS

1. GENERAL. This ANNEX outlines the use and requirements for the maps and charts required to implement the BASH Program to include:

- a. MacDill AFB Habitat Map.
- b. Low level Activity map.
- c. Avon Park Activity Plotting Charts.
- d. Airfield Activity Plotting Charts.
- e. (As required).

2. MACDILL AFB HABITAT MAP:

a. Background: A habitat survey was conducted at MacDill AFB in August 1978 and the specific habitats which are available to birds were determined. The description of the habitats and modifiers are in APPENDIX Q-1-1 of this ANNEX. A copy of the survey is maintained at the Environment Office (DEEV) and the Safety Office.

b. Use: Once a specific hazard is identified and the location of the activity can be isolated, the habitat map should be consulted to determine if a specific attractant to that species exists which can be altered within the scope of this program.

c. The habitat map will also be used as a guide for the long range Civil Engineering Program of removal of actual and potential habitats on MacDill AFB; proposed Operation "Bird Bare."

3. LOW LEVEL ACTIVITY MAP:

a. A large scale map with a depiction of all the current low level routes will be maintained at the Office of Safety, (SEF).

b. All bird strikes, near misses and areas of observed significant bird activity which are reported on the low level routes will be plotted on this chart.

c. This data will be studied and disseminated to the flying units IAW the procedures outlined in ANNEX B.

d. This data will also be used to determine if certain route usage be discontinued or altered.

4. AVON PARK ACTIVITY MAP:

OPR: 56TFW/SE

a. A large depiction of the Avon Park Gunnery complex will be maintained at the Office of Safety, (SEF).

b. This depiction will be used in the same manner as the Low Level Map.

5. AIRFIELD ACTIVITY PLOTTING CHARTS AND LOGS:

a. Sufficient quantities of the Airfield Activity Plotting Chart will be kept available for use during surveys and bird study operations.

b. The specific use of these charts and log, APPENDIX Q-1-3, 4 and 5 will be outlined as required during the specific operation or as determined by the BASH Working Group.

6. (Other Maps & Charts will be added as required)


JOHN R. VICK, Major, USAF
Chief, Safety Division

HEADQUARTERS 56TH TACTICAL FIGHTER WING
MACDILL AFB, FLORIDA 33608
30 JULY 1978

APPENDIX 1 TO ANNEX Q TO 56 TFW PLAN 127-15
MACDILL AFB HABITATS

Water:

- Modifier - Drainage ditches
- Borrow ponds
- Natural ponds
- Tidal creeks
- Open bay

Varies from fresh to salt.
Strength depending upon site.

Mangrove: Red, Black and White

- Modifier - Mangrove along drainage ditches and on higher sites
invaded by Florida Pepper bushes

Hardwood Hammock: Oak

Grass:

- Modifier - Closely maintained in and around runway and primary roads.
- Periodically maintained in fields, irrigation site, etc.
May be invaded by Dog Fennel, Ragweed, Sesbania and some
brush.
- Disturbed sites where grass is primary invader, but being
replaced by brush.

Wet Grass:

- Modifier - Areas, either natural or manmade, where moist soil, plants,
red root, Saggitaria, Beakrush, Cyperus, etc, dominate.

Borrchia, Glasswort Flats:

- Modifier - Type is largely being lost in invasion by Florida Pepper.
- Type also contains Slat bush (Baccharis) invaders.

Brush: Wax Myrtle, Florida Pepper, Willow and Scrub Oaks

- Modifier: Bush areas closest to salt water environments are predo-
minantly Florida Pepper which has invaded and masked native species.
- Upland sites are Wax Myrtle and Saltbush. They contain
a variety of species as transition area to high uplands.
- Upland brush contains Saw Palmetto, Scrub Oaks, Wax Myrtle,
etc.
- Disturbed areas contain a mixture of broad leaf (Dog
Fennel and Ragweed) and brush (Wax Myrtle, Florida Pepper,
etc.)

Planted Pines:

- Modifier - Understory varies depending upon original site.

OPR: 56TFW/SE

Mature Pines:

- Modifier - Pine hardwood where pine is mixed with Scrub Oak and Palmetto.**
- Pine/grass where grasses are mixed with broadleaf plants and appear to vary from closely to occasionally maintained.**
- Pine/brush where pine over-story is reduced with heavy brush under-story varying with site from Florida Pepper to Palmetto, Cabbage Palm, Vita and Wax Myrtle.**

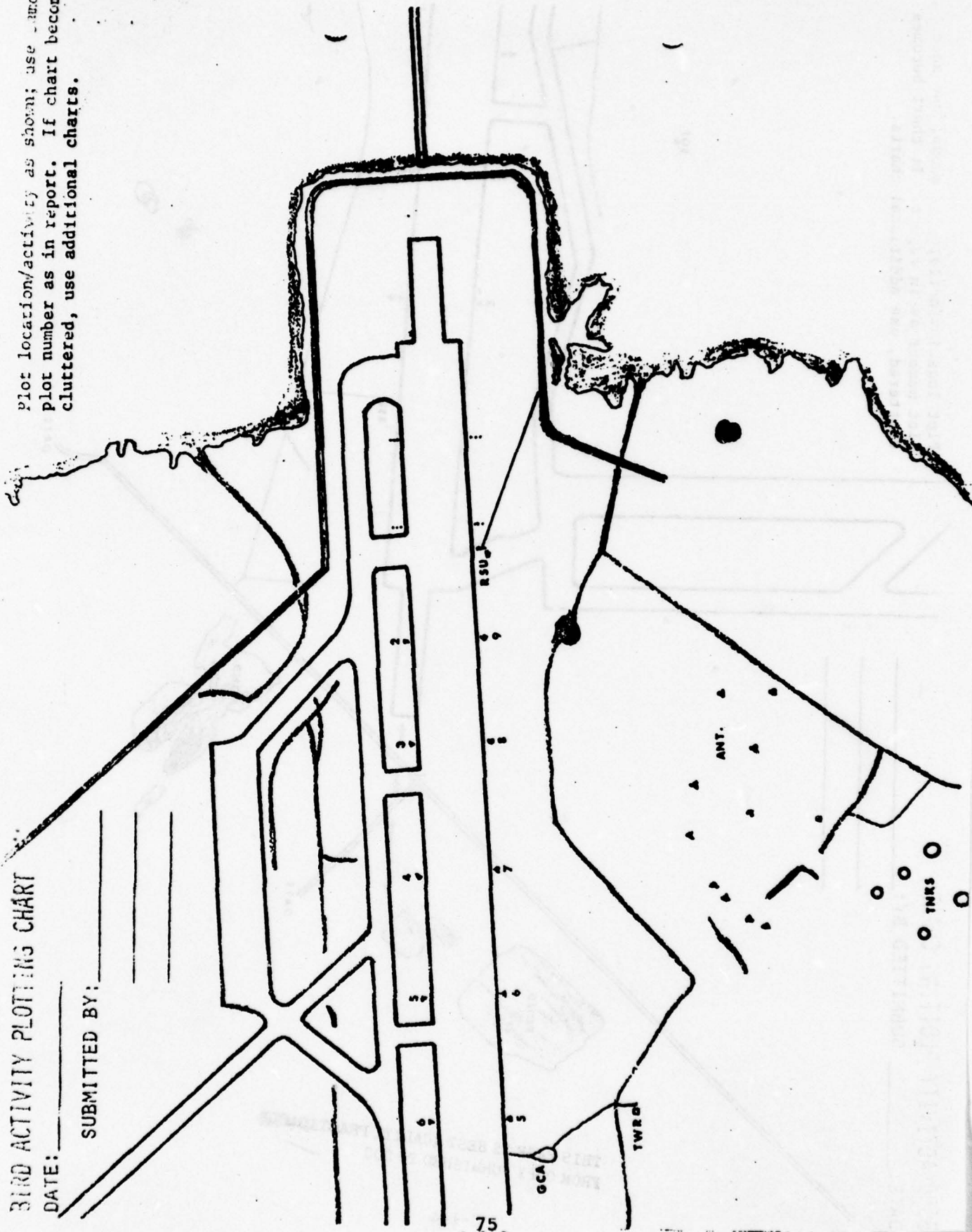

JOHN R. VICK, Major, USAF
Chief, Safety Division

BIRD ACTIVITY PLOTTING CHART

DATE: _____

SUBMITTED BY: _____

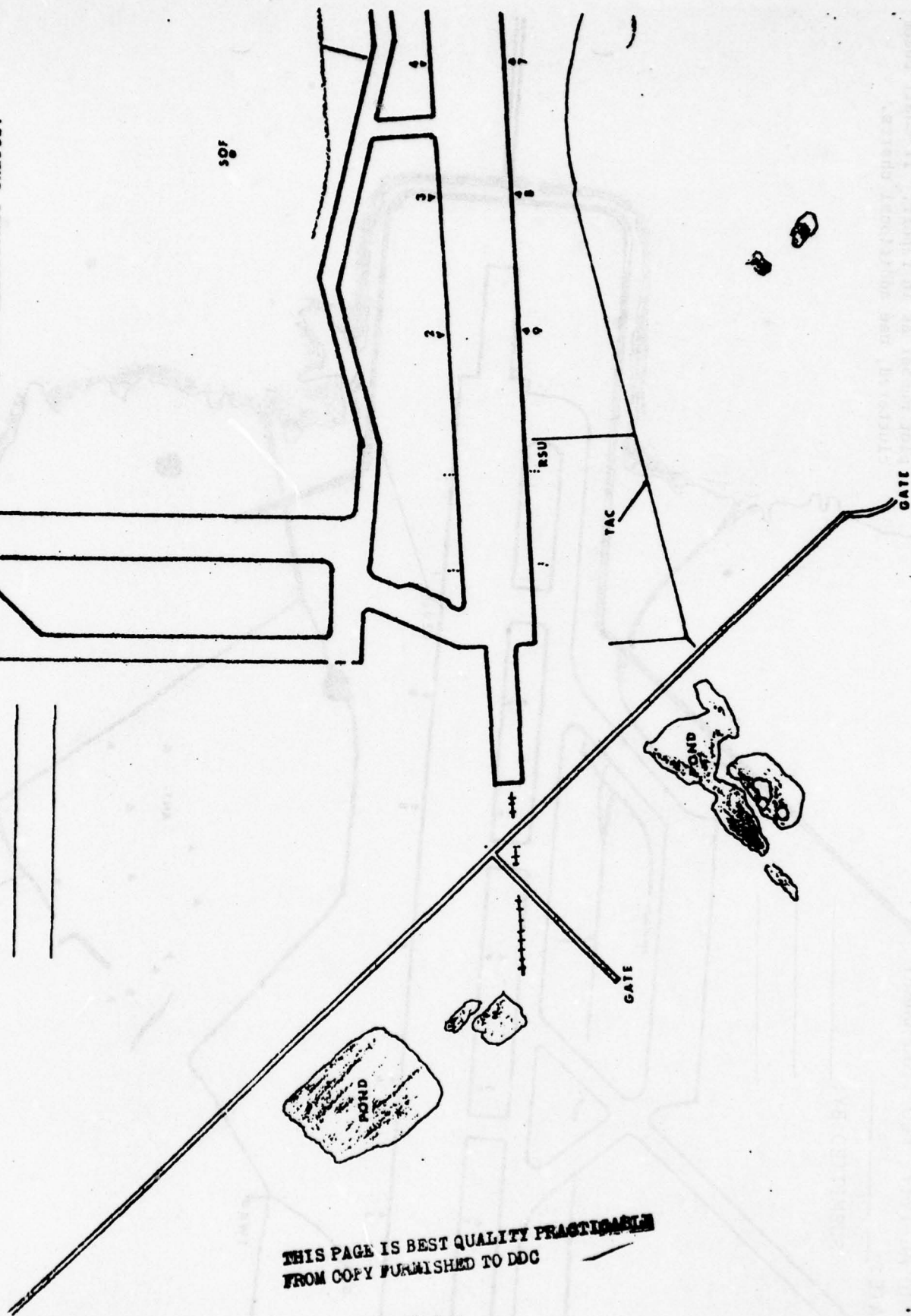
Plot location/activity as shown; use same plot number as in report. If chart becomes cluttered, use additional charts.



BIRD ACTIVITY PLOTTING CHART

DATE: _____ SUBMITTED BY: _____

Plot location/activity as shown; use same plot number as in report. If chart becomes cluttered, use additional charts.



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DATE_

SUBMITTED BY:

BIRD SIGHTING/ACTIVITY REPORT

FILL OUT THIS REPORT WHENEVER SIGNIFICANT ACTIVITY IS NOTED. PLOT FLIGHT PATH/LOCATION ON CHART USING SAME PLOT NUMBER. SEND BOTH CHART AND REPORT TO 56TFW/SEF THROUGH NORMAL DISTRIBUTION CHANNELS.

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ANNEX R TO 56 TFW PLAN 127-15
REPORTS AND FORMS

1. GENERAL. This ANNEX outlines the procedures and forms required to report birdstrikes IAW AFR 127-15 and near misses to enhance the BASH Program at MacDill AFB.

2. AFR 127-15, BIRD STRIKE REPORT. The Office of Safety will compile all reported bird strike data and submit the completed AF Form 441 to 9th Air Force not later than the 15th of the month following the reporting period (Quarterly). Information copies of this report will be furnished to the Wing Commander and the BASH Working Group. The data will be collected as indicated below:

56 TFW Bird Aircraft Strike Hazard (BASH) Report Form Letter.

a. 56TFW/SEF will insure sufficient copies of the form letter (R-1-1) are available to all squadron FSOs and at Base Operations.

b. This form letter is dual-functioned and only the actual strike function of the form will be discussed in this ANNEX. Near miss or activity reporting is discussed in ANNEXES B and Q.

3. PROCEDURES. All personnel discovering a bird strike will notify Safety as soon as possible. This is required to insure that the evidence and any remains are preserved to enable identification of the species of bird involved in the strike. During non-duty hours, Maintenance and Base Operations personnel will make arrangements for the preservation of remains until Safety assumes responsibility for them.

a. The aircrew involved in the strike will fill out the form, providing as much information as possible concerning circumstances of the incident.

b. Base Operations personnel will assist transient aircrews in this when applicable and will obtain unit/organization information when damage occurs.

c. For MacDill AFB aircraft, if the damage is sufficient for AFR 127-4 Mishap Reporting, a Mishap Report will be submitted in addition to the Bird Strike Report.

OPR: 56TFW/SE

FROM: SQUADRON: _____ AIRCREW: _____ CALL SIGN: _____ DATE: _____

SUBJECT: Bird Aircraft Strike Hazard (BASH) Report

TO: 56 TFW/SEF

This report is to be filled out for all actual birdstrikes and any near-miss situations. Your help, in particular, on close encounters will greatly help in getting action taken to reduce the hazards involved with birds in our local flying area. Fill in all blocks as well as you can. Give approximations if exact data is unknown and indicate that it is an approximation. If you have any questions, call 56 TFW/SEF, 3384.

- a. Month/day of occurrence: _____ Local time: _____
- b. Light conditions (circle or use other is significant): Dawn, Hazy, Bright, Dull, Dusk, Dark, Night, other; _____
- d. Aircraft type: _____ Aircraft serial number: _____
- e. Landing light (ON/OFF): _____ Beacon (ON/OFF): _____
- f. Phase of flight (describe): _____
- g. Aircraft speed: _____ Heading: _____ Altitude: _____ MSL.
- h. Flight path (in relation to clouds if any, i.e., above, below, etc.) _____
- i. Geographic location: (try to be as specific as possible) _____
coordinates: _____ if in pattern (flare, short final, etc.) _____
any ground references: _____
- j. Species and number of birds (if unknown, try to describe color, size, etc.): _____
- k. Impact point on aircraft (if applicable): _____
- l. Remarks (any information you may feel valuable to the program, i.e., what were the birds doing when you saw them?) _____

- m. Evasive action:
- (1) By pilot (YES/NO) _____ What? _____
- (2) By bird (YES/NO) _____ What? _____
- n. Bird remains on aircraft (YES/NO): _____
Scrap whatever feathers, flesh, etc., that are available into a plastic bag (obtainable from Maintenance) and notify Safety, ext. 3384 ASAP. The remains will be collected by a representative from Safety for evaluation.

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ANNEX S TO 56 TFW PLAN 127-15

BIRD HAZARD WARNING SYSTEM: OPERATION BIRDWATCH

1. GENERAL. This operation establishes procedures to be used for the immediate exchange of information between ground agencies and aircrews concerning the existence and location of birds which could pose a hazard to flight.

2. BIRD WATCH CONDITIONS. The following terminology will be used for rapid communications to disseminate bird activity and implement unit operational procedures. The terminology will also be included and updated as required in the MacDill AFB portion of the Flight Information Publication (IFP Supplement -United States).

a. Bird Watch Condition Red. Heavy concentrations of birds above and immediately in the vicinity of the runway pose an immediate hazard to safe flying operations. The area declared "Red" shall be open only by specific pilot request upon being advised of the condition.

b. Bird Watch Condition Yellow. Concentrations of birds observed or predictable in locations which represent a probable hazard to safe flying operations. Declaration of Condition "Yellow" requires increased vigilance by all agencies and extreme caution by aircrews. Bird Watch Condition Yellow will also be used for warning aircrews of conditions on low level routes and at Avon Park as warranted.

c. Bird Watch Condition Green. Normal bird activity in the area. This condition will be in effect for the remainder of the flying day whenever a red or yellow condition had been declared and subsequently downgraded. Upon extended normal bird activity, no bird watch condition need be declared.

3. AUTHORITY. During normal 56TFW flight operations the authority to declare a Bird Watch Condition is solely vested with the 56TFW Safety Office. The MacDill AFB Chief of Airfield Management or his designated representative, is the declaring authority during all other periods.

Bird Watch Condition Yellow will be declared for a special area upon the advice of tower, RSU Officers, RCO at Avon Park, GCA, or flight leads on low level routes when significant activity is observed visually or on radar. All operations personnel should be alert for bird activity and should report such directly to Safety (ext 3384) or Airfield Management (ext 2231) as applicable, or through one of the following agencies:

- a. Wing SOF
- b. Control Tower or GCA

OPR: 56 TFW/SE

c. Command Post

d. RSU

e. Avon Operations

4. COMMUNICATIONS. Bird Watch Conditions will be disseminated by the following means:

a. During periods of 56 TFW Flight Operations:

(1) The reported Bird Watch Condition at MacDill AFB and associated low level routes will be displayed on Det 32, 3rd Weather Wing TV briefing equipment. The display (Attachment S-1-1) will be prepared and updated by Base Operations personnel based upon inputs from the 56TFW Safety Office. In addition to posting the Bird Watch Condition on the weather TV equipment, Base Operations personnel will insure that a duplicate copy of the information is posted in the Flight Planning Room to advise Transient aircrew personnel.

(2) Base Operations personnel will telephonically notify the following agencies of Bird Watch Conditions:

(a) 56TFW Command Post

(b) MacDill AFB Tower

b. During period of non-56TFW flight operations all procedures listed above will be implemented with the exception of posting the Bird Watch Condition on the TV briefing equipment.

c. The primary means of transmitting Bird Watch Conditions to airborne aircraft will be via ATIS. However, under Bird Watch Condition Red, the MacDill Air Traffic Control Agency will insure that the pilot understands the condition and is provided the option to delay, divert, or to continue the proposed operation into the hazardous area.

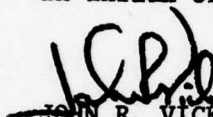
5. AIRCREW RESPONSIBILITIES AND PROCEDURES. If while in flight, an aircrew observes or encounters any bird activity that would constitute a hazard to flight the aircrew should contact either the SOF, Control Tower, Command Post, or Avon Operations and request that the observed bird activity be passed to SEF at extension 3384. The following information should be included:

a. Call Sign

b. Location


c. Altitude

- d. Local time of sighting
 - e. Approximate number of birds
 - f. Type of bird (if known)
6. PROCEDURES FOR SOF AND DOC. If a bird activity report is received from an airborne aircraft, the Wing Safety Office or Base Operations will be notified as appropriate.
7. DOWNGRADING. Once a Bird Watch Condition has been declared by Safety or Base Operations personnel, it is their sole responsibility to either cancel or downgrade the condition commensurate with updated information.
8. BIRD WATCH ALERT. In addition to Bird Watch Conditions of RED, YELLOW and GREEN, a Bird Watch Alert may also be declared. This indicates that the weather, time of day and/or seasonal conditions are such as to expect an influx of birds onto the airfield.


JOHN R. VICK, Major, USAF
Chief, Safety Division

BIRD WATCH

CONDITION

	MCF	IRs	Remarks
GREEN			
YELLOW			
RED			

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HEADQUARTERS 56TH TACTICAL FIGHTER WING
MACDILL AFB, FLORIDA 33608
30 JULY 1978

ANNEX 2 TO 56 TFW PLAN 127-15
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13 TFTS	1
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62 TFS	1
63 TFS	1
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SV	1
DC	1
OTM	2
SS	1
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CSS	2
<u>OTHER UNITS</u>	
1928 CG/FFA	1
USAF Regional Hospital	1
Det 32, 3 WS	1

CPR: 56 TFW/SE

Z-1

APPENDIX C

Alternatives for Bird Control Unit (BCU) Composition

Effective bird control on airfields results from dawn to dusk harassment of the birds. Needs of different bases vary depending on the extent of the problem, number of missions flown, and hours of daylight. Mole and rabbit control is currently contracted to civilian firms. A fully equipped and manned BCU can assume this responsibility and increase cost-effectiveness at each base. The number of personnel assigned to the BCU will determine the overall tasking potential.

The Airfield Manager is recommended as supervisor of the BCU. A minimum of one, and preferably three, personnel should be assigned to the BCU. The NCOIC of Base Operations should also be trained in bird control to assist during times of severe bird problems. This job requires a mature individual, capable of using his own judgment, being inventive, being responsible for the use of firearms and, on occasion, the use of toxic materials. All individuals selected must possess a military driver's license and be certified to drive on the flight line. Training in bird control will be necessary to effectively participate on the BCU. The British have an excellent bird control school operated through the Ministry of Agriculture Fisheries and Food. Training can be either by this school or by personnel who have attended the school.

The BCU can be staffed by military or civilian personnel, or a combination of both. The primary advantage in hiring a civilian for the BCU is the continuity that can be maintained in the bird reduction program by having a civilian permanently employed by the base. The civilian hired should be a British national to encourage personnel retention. An adequate supply of trained people can be found from former British airmen trained for bird control while on active duty. The civilian hiring program has several disadvantages. The British Civil Service has a classification system which states that if there is not an existing full time need for the position or if entry numbers for the position are limited, individuals accepting employment and training for specific jobs with US forces would be placed in a non-competitive work category. These people would face difficulties returning to work within the British system. It is U.K. policy to discourage this situation. U.K. nationals would be entitled to a salary and approximately 8 to 10 percent employer contribution to the retirement fund. Bird control at most

U.K. civil airfields is currently a secondary duty of fire departments and no category for a bird control specialist exists in their system.

An alternative to hiring British nationals is to hire American nationals for the position in the BCU. Presently there is no established category in the Civil Service for a bird control specialist. The category most likely to provide suitable personnel is the professional biologist series. It is unlikely the Air Force can hire an individual with prior training in this category. Prior experience would suggest a minimum of a GS-7 level. Under GS contracts for overseas employment, individuals selected would be entitled to many benefits in addition to their base salary. Some of these benefits include \$3,000 housing allowance, transportation of the individual, his family, household goods and vehicle, home leave expenses, use of overseas medical facilities, etc. When the basic expense overhead is considered and coupled with the indefinite duty period status of the individual, it is doubtful if this alternative is cost-effective.

The use of military personnel to provide bird control has several advantages. The long, sometimes unpredictable schedule required for the position in the BCU lends itself more readily to military management. At other Air Force bases, military have exclusive responsibility for airfield bird reduction. The extent of the problem dictates the manpower needed. For example, at Langley AFB an NCO is retained with the full-time responsibility of bird control. At bases such as Wurtsmith and Griffiss, the Airfield Manager assumes the job of bird removal. Several difficulties with military participation on the BCU exist. Sources for manpower are severely limited. Base Operations personnel are usually tasked with the responsibility of bird control; however, bird control is not listed as part of their job description. To date, no formal military training program for bird hazard reduction exists. Rotation of personnel creates problems in program continuity, but an accurate daily log makes it easier for new personnel to become familiar with recurring bird problems.

We feel that the best bird hazard reduction program can be implemented with a BCU that is made up of military personnel. While difficult to initiate because of the lack of formal Air Force manpower slots, the overall program can be effectively handled by the military.

APPENDIX D

Suggested Duty Requirements for Bird Control Unit (BCU) Personnel

A Bird Control Unit will have responsibility for removing hazardous birds from airfields. Their specific responsibilities and duties should be defined by the Bird Hazard Reduction Plan. Different bases have unique requirements and may alter the outline to fit their specific needs.

A standardized procedure for operation of a BCU will facilitate a program responsive to needs of individual bases. A permanent record of daily activities is a valuable tool for recognizing trends in bird populations and building program continuity so operational and safety requirements can be met. The record is also useful for evaluating manpower requirements for each base. The following list is provided as an example.

1. The BCU should operate under the direct supervision of the Airfield Manager.
2. The BCU's work hours should depend on the daily flying schedule.
3. An airfield check should be completed and any birds observed dispersed before aircraft movement begins for the day. A check of the active runway should be completed not less than 10 minutes prior to the first scheduled mission of the day. Airfield checks will continue throughout the day until dark.
4. Contact with the Control Tower and the Runway Supervisory Unit (RSU) must be maintained to ensure safe activity near the runway.
5. Bird activity observed by Control Tower, RSU, Security Police, Fire Prevention or Base Operations personnel can be reported to the BCU immediately to expedite bird removal.
6. Rabbits or hares can be controlled by the BCU using appropriate methods (hunting, trapping and poison).
7. The BCU may be given the responsibility of removing pest birds in hangars and storage buildings. A trapping and shooting program should be conducted as needed. The Base Commander's approval is required to carry out any bird killing program.
8. The BCU should be responsible for the following equipment:

- a. Binoculars.
- b. Radios.
- c. Bioacoustic equipment.
- d. Pyrotechnics.
- e. BCU vehicle.

9. The BCU should check Base Operations daily for Birdtam and meteorological information.

10. The BCU should keep a daily log of activity. This log will be used to determine bird population trends, document specific problems, and track use of pyrotechnics. As a minimum, the daily log should include the following:

- a. Date.
- b. Weather condition.
- c. Time of first runway check.
- d. Time when birds were observed.
- e. Number and species of birds observed.
- f. Method of bird dispersal.
- g. Number of shellcrackers expended.
- h. Number of birds killed.
- i. Hares and rabbits removed.
- j. Pest birds trapped or poisoned.
- k. Significant activity on airfield - i.e., grass cutting, maintenance, etc.
- l. Significant activity off base - i.e., plowing, construction, burning, timer harvesting.
- m. Variations in or near airfield habitat - standing water after a rain, vegetation in bloom.
- n. Significant changes in airfield bird population sudden appearance of bird flocks.
- o. Time of the final runway check.
- p. Number of man-hours expended in bird control.

APPENDIX E

Authorized Bird Control Equipment

For bases requiring active bird scaring techniques the following equipment is authorized for bird identification and dispersal:

<u>Nomenclature</u>	<u>NSN</u>	<u>TA</u>
Binoculars, prism type	1240-00-5300959YB	479/483
Shotgun, single barrel	1005NC121528L	479/483
Pistol, pyrotechnic	1095-00-726-5637	479/483
Simulator airburst	1370-00-028-6007	-
Shellcrackers, 12 ga.	1305ND042951G	-
Cassette Type Player	5835-01-053-3152	*
Speaker	5965-01-053-6210	*
Amplifier, mobile	5830-01-054-4954	*

* Stocklist action has been completed and upon receipt of NC/NSN items will be added to TA 483.

This memorandum may be referenced to justify procurement of items from TA 483, which is a Civil Engineering TA. Any organization responsible for bird control on the base may procure this equipment.

APPENDIX F

DIRECTORATE OF ENVIRONMENTAL PLANNING
AF Engineering and Services Center
Tyndall Air Force Base Florida 32403

DEV Operating
Instruction 127-1

Safety

HANDLING OF PYROTECHNICS

This OI establishes policies and procedures for safe handling of pyrotechnics used at Air Force installations by the Bird/Aircraft Strike Hazard (BASH) Survey team. It applies to all members of the BASH team conducting such surveys and to personnel at survey bases instructed in the use of pyrotechnics by BASH team personnel.

References: (1) AFR 127-100, Explosive Safety Standards; (2) 11A-1-10, Munitions Serviceability Procedure; (3) TO 11A10-24-7, Storage and Maintenance Procedures for Pyrotechnics; (4) TO 11A-1-42, General Instructions for Disposal of Air Munitions; (5) TO 11A10-27-7, Storage and Maintenance Procedures Simulators (Battlefield).

1. This OI covers the M74A1 simulator airburst and 12 gauge scare cartridges.

2. RESPONSIBILITIES:

a. Explosives Safety Officer/NCO: Responsible for insuring compliance with this OI by all personnel who are involved in Air Force Engineering and Services Center field assistance and training activities. They will periodically review and update this OI as safety and training requirements dictate.

b. Officer in Charge, BASH Reduction Program: Responsible under the guidance of the Explosive Safety Officer/NCO and acts in their absence to insure compliance with this OI by all personnel involved with AFESC field assistance activities.

c. BASH Survey Team Chief: Under the guidance of the Chief, BASH Reduction Program, performs all actions necessary to issue and control pyrotechnics as outlined in this OI and stated references.

d. Other BASH Team members: All field assistance team personnel must be fully knowledgeable of and adhere to the contents of this OI. Negligence or noncompliance will be considered grounds for dismissal from that portion of field assistance training and use, or administrative disciplinary action. This OI is part of the training/evaluation program and will be part of the AFESC/DEVN required reading file.

3. PROCEDURES:

a. Nature of Operations: The BASH Team frequently uses and recommends the use of the M74A1 Simulator Airburst, NSN1370-00-028-6007 or the 12 gauge scare cartridge, NSN 1305ND042951G for use on the airfield to disperse birds which pose a threat to aircraft. These items are shipped from Hill AFB to the AFK account (Munitions Supply) at the base to be surveyed. All team members will strickly adhere to the following rules when pyrotechnics are being used or demonstrated.

(1) Pyrotechnics will be fired at an angle of not less than 45 degrees from ground level and never in the direction of any person, vehicle, or building closer than 1,000 feet.

(2) For shellcrackers, a single barrel, break open shotgun, NSN 1005NC121528L, or other approved methods will be used. The weapon will be visually inspected following each round fired to insure that it is free of obstructions. After each days use, the barrel will be thoroughly flushed with hot water, dried and oiled.

(3) All firearms safety rules listed on AF Form 497, Air Force Policy Statement - Firearms Safety and Use of Force will be followed (Atch 1). Failure to adhere to additional safety precautions could result in loss of limb, oversight, or life.

(a) No person shall ignite the M74A1 Airburst or 12 gauze scare cartridges without wearing leather gloves, goggles and earprotectors.

(b) There will be no smoking at any time within 50 feet of pyrotechnics.

(c) No pyrotechnics will be handled near open flames.

(d) Pyrotechnics will be kept under visual observation at all times after they are issued and until they are expended.

(e) If at any time any pyrotechnics malfunction, all personnel will stay clear of that area for a minimum of 30 minutes. The exact position of the malfunction will be brought to the attention of the OIC of the BASH team. If the malfunction presents a potentially greater hazard to personnel, it will be placed in a wooden lined, metal container and removed from the immediate area. The BASH team

chief will then notify the Base EOD and inform them of the malfunction. They will send a team out to the area for proper disposal. At no time will the BASH personnel dispose of any malfunctioned pyrotechnics.

b. Storage of Weapons: All weapons will be stored each night at the Security Police Armory and checked out on a daily basis to support the BASH survey.

c. Storage of Pyrotechnics: All pyrotechnics will be returned to Munitions Supply each night and taken from the armory on an "as needed" basis. Cartridges will be stored in sealed metal ammunition boxes when not in use. Spent M74A1 casings will be turned in for disposal.

d. Location of Operations: The location of operations will be on the airfield of the surveyed base for active bird repulsion only. The Explosives Safety Officer at the base being assisted may opt to use an area other than the airfield for pyrotechnic demonstration and personnel training. In such situations, the BASH team will insure that personnel being directed in pyrotechnic use strictly adhere to this OI.

e. The following equipment is required, as a minimum, when transporting pyrotechnics.

(1) Four "Explosives 'B'" placards for vehicle transporting pyrotechnics (provided by AFESC for BASH surveys only).

(2) Pyrotechnics carrying bags/boxes and leather gloves (provided by AFESC for BASH team members only).

(3) Portable 2-way radio for control tower clearance prior to firing pyrotechnics (provided by AFESC).

f. Procedures for Pyrotechnic Operations:

(1) Demonstrations and Training.

(a) Notify all applicable offices of the location and nature of pyrotechnic operations.

(b) Proceed to area where demonstration/training is to be conducted.

(c) Brief attending personnel on the proper, safe use of pyrotechnic devices. Insure that personnel firing pyrotechnics don all applicable safety equipment.

(d) Remove pyrotechnics from storage box and insert into the flare pistol/shotgun.

(e) Grip the pistol/shotgun with both hands, angle at a minimum 45 degrees, and fire.

(f) Inspect the weapon chamber prior to each loading to insure that it is free of obstruction.

(g) After demonstration, clear the weapon, return pyrotechnics to storage container, and return them to the appropriate office.

(2) BASH team dispersal of birds:

(a) Proceed to area identified to have birds.

(b) Obtain control tower clearance to fire pyrotechnics.

(c) Don all applicable safety equipment.

(d) Remove pyrotechnics from storage box, exit vehicle, and load the flare pistol/shotgun.

(e) Grip the weapon with both hands, angle high toward target and fire.

(f) Inspect the weapon chamber and barrel prior to reloading to insure that it is free of obstruction.

(g) After bird dispersal, return pyrotechnics to storage box and return to the appropriate office.

g. Personnel Safety Requirements.

(1) BASH team personnel must annually attend the AFESC/DEOT explosive safety training course at Tyndall AFB.

(2) Personnel receiving pyrotechnics instructions will be given a safety briefing prior to BASH demonstrations.

h. Issue of Pyrotechnics:

(1) Issuance will be by the BASH team chief in the minimum quantities required for a specific portion of bird control or pyrotechnics demonstration.

(2) Pyrotechnics will not be used on the airfield without advance coordination with the following base organizations:

- (a) Command Post
- (b) Hospital
- (c) Security Police
- (d) Fire Department
- (e) Ground Safety
- (f) Base Commander

In the event of an emergency situation requiring birds to be dispersed from the airfield, the BASH team will request by radio to the control tower that tower personnel notify the appropriate offices of pyrotechnics use and the general location of BASH team personnel.

i. Fire Protection:

(1) All personnel using pyrotechnics will comply with regulations, directives, manuals, and TO's pertaining to fire prevention/protection.

(2) Two class 10 B/C fire extinguishers will be immediately available and in operating order.

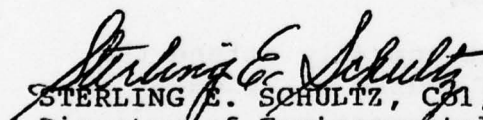
(3) In the event of a fire on the airfield or at the demonstration area, BASH personnel will:

(a) Halt use of pyrotechnics.

(b) Attempt to extinguish the fire using the fire extinguishers.

(c) Notify the control tower and have them relay information the the Fire Department.

OFFICIAL


STERLING E. SCHULTZ, Col, USAF
Director of Environmental Planning

1 Attachment
AF Form 497

AD-A073 062

AIR FORCE ENGINEERING AND SERVICES CENTER TYNDALL AFB FL F/G 1/2
AN EVALUATION OF THE BYRD /AIRCRAFT STRIKE HAZARD AT SELECTED U--ETC(U)
JUN 79 J S KENT, J SCOTT, W H NIEMEIER

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MICROCOPY RESOLUTION TEST CHART
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AIR FORCE POLICY STATEMENT - FIREARMS SAFETY AND USE OF FORCE

1. Every member and civilian employee of the United States Air Force has the right under the law to use reasonable, necessary force to defend himself against violent and dangerous personal attack. The limitations described herein are not intended to infringe this right but to promote weapons safety, and prevent the indiscriminate use of firearms and other types of deadly force. This policy statement applies to all personnel who bear firearms in accordance with AFR 125-26.

2. FIREARMS SAFETY RESPONSIBILITIES:

a. To lessen the possibility of accidental discharge, firearms must be loaded and unloaded, whenever possible, at a clearing pit established at each firearms storage facility. As a minimum, loading and unloading will be supervised by a knowledgeable NCO who is also qualified with the weapon. (See AFR 125-26, paragraph 10c.)

b. Firearms will not be drawn or aimed except in compliance with Air Force policy on the use of force, if necessary to lawfully apprehend or if their authorized use appears imminent or the weapon is turned into storage.

c. Warning shots will not be fired. This firing is a hazard to innocent persons and may prompt a suspect to return the fire, further endangering innocent bystanders.

d. If firing at a person, the marksman should aim to wound, rather than to kill.

e. Because of the solemn responsibilities involved, it is imperative that prior to being authorized to bear firearms, all personnel are thoroughly indoctrinated in their use and the circumstances in which firearms may be justifiably used.

f. The unauthorized discharge of any firearm, whether it is an accidental or deliberate act, is a serious matter and must be thoroughly investigated. Any person who is aware of such an incident will report it to the Chief of Security Police who will immediately initiate an investigation.

3. FIREARMS SAFETY RULES: I will:

a. Promote firearms safety through my own actions.

b. Never carry a round of ammunition in the chamber of any weapon that uses a bolt assembly or slide operating mechanism, except at my commander's direction when in combat or other hostile situation.

c. Never draw firearms as a joke or jest.

d. Never use a firearm to play tricks, games, quick-draw, or engage in any other form of horseplay, or allow myself to become involved in unauthorized acts.

e. Never use firearms against individuals who have committed only minor offenses or crimes.

f. Regard all firearms as being loaded.

g. Know and use the safety devices of all firearms with which I am armed.

h. Never aim or point a firearm unless I intend to shoot.

i. First identify my target and insure a clear field of fire before discharging a weapon.

j. Be especially cautious when loading and unloading a firearm.

k. Never arm myself with a weapon I am not fully qualified to use.

l. Bear in mind at all times that my conduct in handling the weapon is my own responsibility.

4. USE OF FORCE:

a. Personnel may use force to discharge assigned duties only when force is absolutely necessary. The degree of force used must be the minimum necessary to accomplish the duty. Application of an excessive amount of force is detrimental to the maintenance of law and order and may subject the one who applies it to disciplinary action. The minimum force necessary may include physical apprehension and restraining techniques, chemical dispersers, the baton, or the military working dog; all of which result in an application of less than deadly force.

b. The use of deadly force (that force applied with the intent of causing, or which a reasonable person should know would cause, death or serious bodily harm) is prohibited, except as a last resort. The use of deadly force is justifiable only as a last resort under the following circumstances:

(1) To protect themselves from loss of life or serious bodily harm.

(2) To protect the life of another, or to prevent the commission of a serious offense involving violence and threatening death or serious bodily harm (such as arson, armed robbery, aggravated assault, or rape).

(3) To remove the threat of theft, destruction, or espionage aimed at property or information designated by an installation commander or other competent authority, as vital to national security.

(4) To prevent actual theft or destruction of property designated by an installation commander or other competent authority which - although not vital to the national security - is of substantial importance to the national security. Falling within the purview of this instruction is property specifically designated as having substantial importance to the national security under the Base Resource Protection Program, for example mission essential fuel storage areas, data processing installations, and other major support facilities or equipment.

(5) To prevent the actual theft of property which is inherently dangerous to others, for example: property which, in the hands of an unauthorized individual, presents a potential threat of death or serious bodily harm to others. This includes weapons, ammunition, explosives, and chemical munitions.

(6) To apprehend or prevent the escape of a person reasonably believed to have committed an act of the nature specified in paragraph 4b(2) above. If the official did not witness the offense, he must have sufficient information to know as a virtual certainty that the suspect either has committed, or attempted to commit, the offense.

(7) To apprehend or prevent the escape of a person whose unauthorized presence in the vicinity of property or information vital to the national security has presented an actual threat of theft, sabotage, or espionage.

(8) To apprehend or prevent the escape of a prisoner whose escape has been determined by the corrections officer or installation commander to create a threat of death or bodily harm to others.

(9) When directed by the lawful order of a superior official governed by AFR 125-26.

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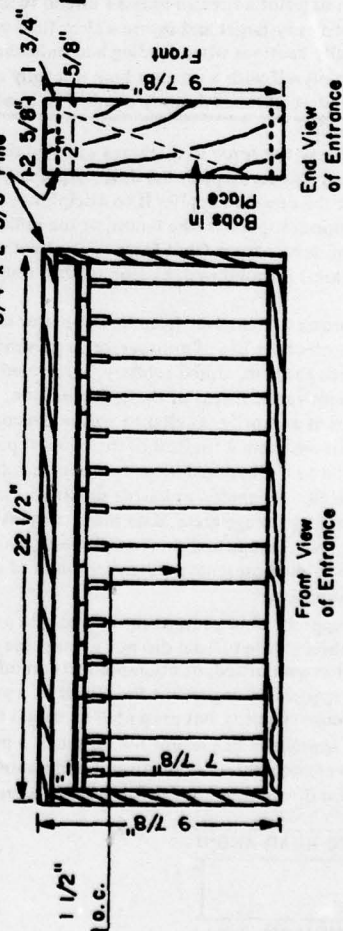
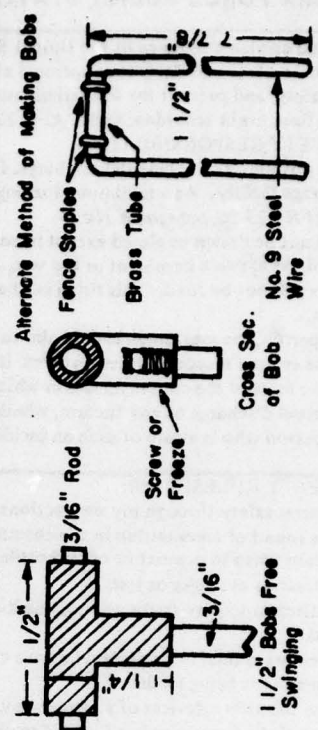
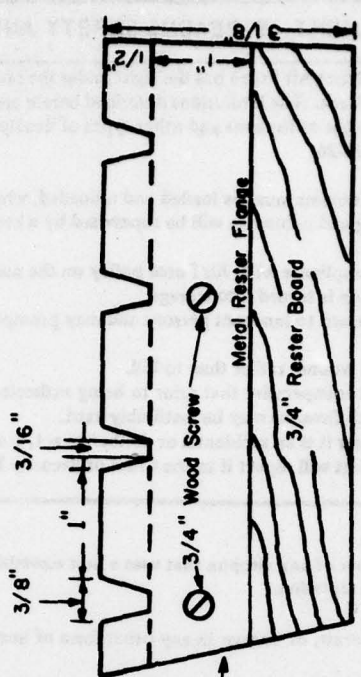
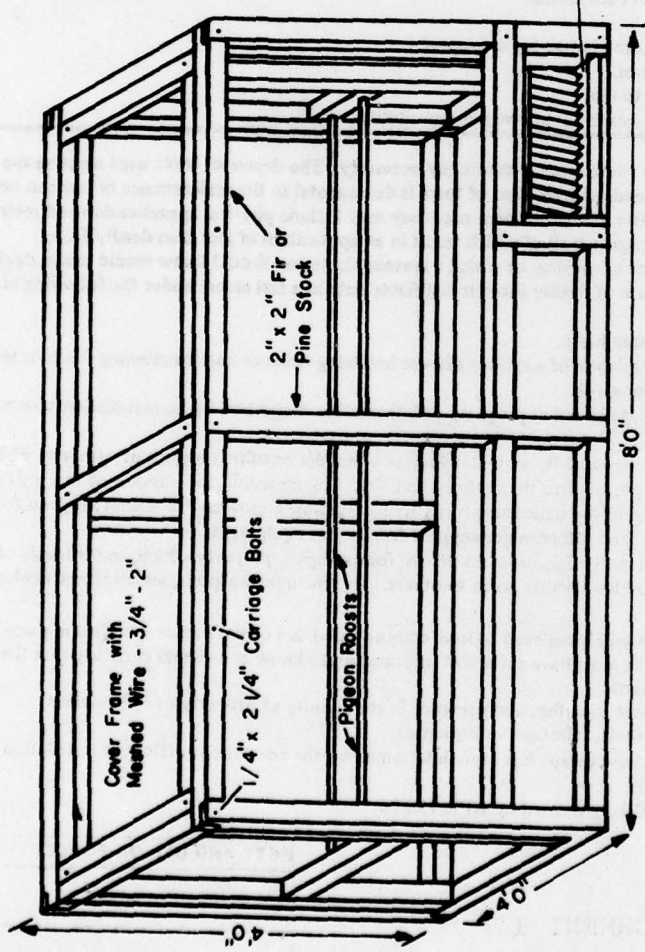
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ATTACHMENT 1

FETY AND USE OF FORCE.

Appendix G Pigeon Trap Design



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		10 TRW/CC	1
		APO New York 09238	
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Washington DC 20012			
OEHL/CC	1	10 TRW/OTM	1
Brooks AFB TX 78235		APO New York 09238	
AFOSR	1	10 CSG/DE	1
Bolling AFB DC 20330		APO New York 09238	
10 CSG/CC	1		
APO New York 09238			

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APO New York 09127		APO New York 09127	
513 TAW/OTM		20 CSG/DE	1
APO New York 09127		APO New York 09194	
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APO New York 09755		APO New York 09127	
81 TFW/SEF	1	513 CSG/DE	1
APO New York 09755		APO New York 09127	
81 TFW/OTM	1	48 TFW/CC	1
APO New York 09755		APO New York 09179	
81 CSG/CC	1	81 CSG/DE	1
APO New York 09755		APO New York 09755	
7206 ABG/CC	1	7206 ABG/SEF	1
APO New York 09125		APO New York 09125	
7206 ABG/OTM	1	7206 CSG/CC	1
APO New York 09125		APO New York 09125	
7206 CSG/DE	1	48 TFW/SEF	1
APO New York 09125		APO New York 09179	
48 TFW/OTM	1	48 CSG/CC	1
APO New York 09179		APO New York 09179	
48 CSG/DE	1	20 TFW/CC	1
APO New York 09179		APO New York 09194	
20 TFW/SEF	1	20 TFW/OTM	1
APO New York 09194		APO New York 09194	
20 CSG/CC	1		
APO New York 09194			